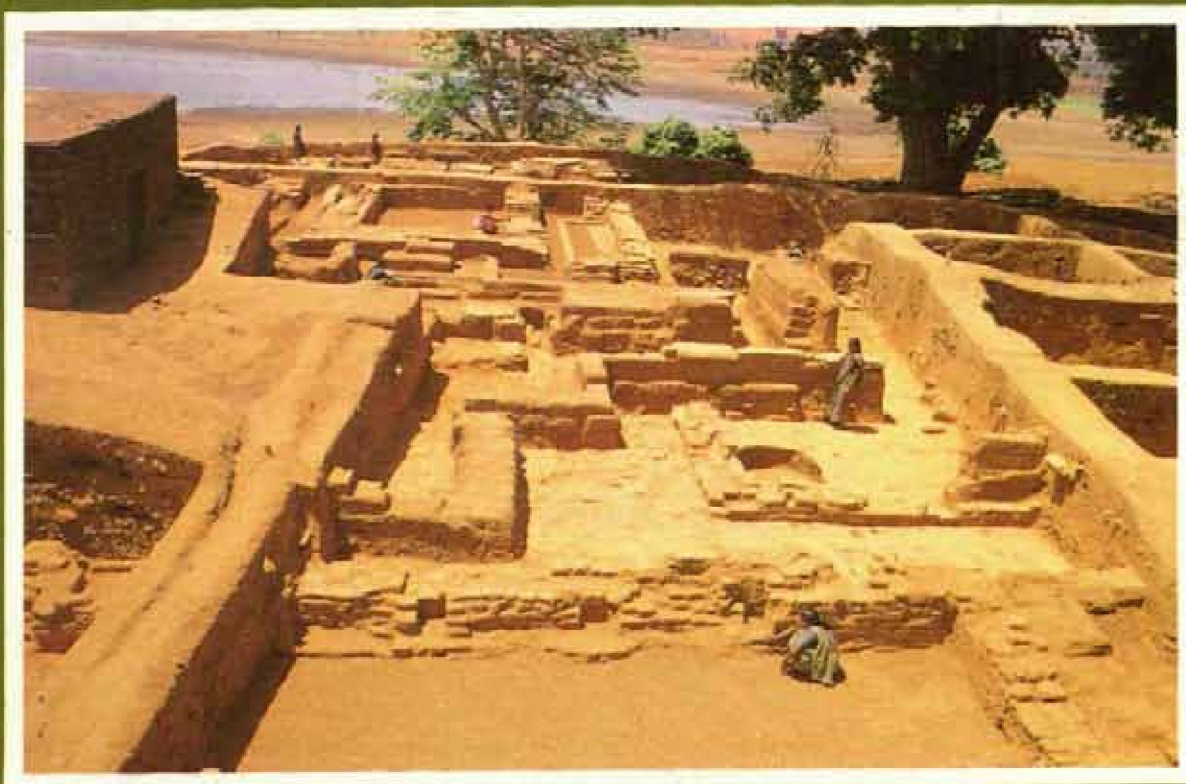
Indian Archaeology

1994-95 – A REVIEW



ARCHAEOLOGICAL SURVEY OF INDIA

INDIAN ARCHAEOLOGY 1994-95 — A REVIEW

EDITED BY

HARI MANJHI C. DORJE ARUNDHATI BANERJI



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front cover : Gudnapura, general view of remains of a brick temple-complex
back cover : Kanaganahalli, drum-slab depicting empty throne and Buddhdpada flanked by chanri bearers and devotees

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PREFACE

In bringing out this annual *Review* after a brief gap of one month, I warmly acknowledge the contributions of all my colleagues in the Survey as also those in the State Departments, Universities and various other Institutions engaged in archaeological researches for supplying material with illustrations for inclusion in this issue. I am sure, that, with the co-operation of all the heads of respective departments, we will soon be able to further reduce the gap in the printing of the *Review*. If contributions are received in time in the required format and style, our task of expediting its publication will be much easier.

The material incorporated herein covers a wide range of subjects comprising exploration and excavation, epigraphical discoveries, development of museums, radio-carbon dates, architectural survey of secular and religious buildings, structural/chemical conservation etc. During the period under review many new discoveries have been reported throughout the country. Among these the survey of buildings in and around Vrindavan associated with mythological tradition is particularly interesting.

I would like to place on record my sincere thanks to my colleagues Shri Hari Manjhi, Shri C. Dorje and Ms. Arundhati Banerji, who are responsible for the compilation, editing and making the material ready for printing, to Shri Hoshiar Singh for preparing the dummy of plates, to Ms. Anju Dhawan and all the staff members of the Publication Section for their assistance at all stages besides Km. Neelam Prasad for computer setting and to Keval Singh for improving the line drawings. Finally, I express my gratitude to Smt. S. Sagar and all the staff members of Bengal Offset Works for their co-operation in bringing out this issue within such a short time.

SB. Mathur
Director General

New Delhi
April 7, 2000

CONTENTS

page 30, line 9 to be read as (Harihara I, AD 1336-1379)

page 42, to be read as Gudnapura

INDIAN ARCHAEOLOGY 1994-95 — A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. EXPLORATION IN DISTRICT GUNTUR.— R.V. Siva Sarma of the Hyderabad Circle of the Archaeological Survey of India[1], explored the village Penumaka and noticed early historical remains containing rock-cut cisterns, massive rubble-walls and mounds on a hillock.

2. EXPLORATION IN DISTRICT KRISHNA.— During the course of exploration, J.Vara Prasada Rao and R. Krishnaiah of the Hyderabad Circle of the Survey, noticed two early historical mounds at Jujjuru near Kanchikacherla in Nandigama taluk which yielded black-and-red ware, black ware and Rouletted Ware.

3. EXPLORATION IN DISTRICT MAHABOOBNAGAR.— In the course of village-to-village explora tion, R. Krishnaiah of the Hyderabad Circle of the Survey, discovered the following remains of archaeological importance.

Village	*Taluk*	*Nature of remains*
Anipur	Maktal	Medieval temple of Ramalingesvara, loose sculptures of Durga,Gq/a-Lakshmi and *nandi* of Vij ayanagara period
Jhiprarpalle	-do-	Late medieval pottery
Pagdimarri	-do-	Early historical site yielding black-and-red ware and associated wares
Samanur	-do-	Late medieval temple of Hanuman
Utkur	-do-	Loose sculptures of Ganesa, Brahma, panels depicting elephant's frieze and basement mouldings of a temple belonging to Kakatiya period; bathing tank, remnants of fortification and Anjaneya temple datable to Vijayanagara period

[1] The Archaeological Survey of India is referred to in the following pages as the 'Survey' only.

4. EXCAVATION AT PUDURU, DISTRICT NELLORE.— The Birla Archaeological and Cultural Research Institute, Hyderabad, under the direction of Kamalakar and V. V. Krishna Sastry, carried out excavation at Puduru, a popular village in Nayudupeta mandal. It is situated 3 km east of Nayudupeta town and spread over approximately 1 sq km, locally named as Malaya Kota or Muniratnapalle. According to the local tradition, the fort once secured the mound and fortifications oriented north-south.

The south and the west sides of the mound are completely occupied by the permanent village settlement. Presumably this portion of the mound is archaeologically potential as evident by the presence of antiquities over the surface. An ancient terracotta ring-well (dia 1 m and depth 9 m) right in the middle of the new settlement proves this fact further. Similar type of terracotta ring-wells were found at Kaveripattinam, Kanchipuram, Karaikadu etc., the famous Indo-Roman trading centres of early centuries of the Christian era. The northern side of the site was dug out for earth works by the villagers.

During the earlier explorations, interesting artefacts in the form of Mediterranean amphorae, devoid of handles, long and conical in shape with thickness ranging from 2 to 3 cm, were reported. Some jars with pointed bottom and a small circular opening at the top have also been found. Similar varieties of amphorae without handles were also found at a few Indo-Roman sites like Arikamedu, Kanchipuram, Nattamedu and Vasavasamudram in Tamil Nadu. Puduru, on the borders of the Andhra-Tamil Nadu states, was selected for excavation with a view to ascertaining the details of settlement pattern of the early historical period in this region. Excavation conducted in four trenches *viz.,* A, K 11, K 25 in different areas revealed a single period of occupation belonging to the early historical period. Three structural activities of well manufactured burnt-bricks (45 x 25 x 7 cm) were traced in three different trenches. In one of the trenches, a wall (72 x 65 cm) with nine brick courses were exposed. The orientation of the structure was north-south. The structures, found in other trenches were also more or less uniform in dimension. The bricks which were used for basement seem to be well-finished and well-burnt. The superstructures probably constructed of used bricks, were noticed at a few places only. In one of the trenches, at a depth of 90 cm was noticed a floor-like structure paved with irregular brick-bats, approximately covering an area of 1.60 m, in north-south orientation. It was however, devoid of any plastering material.

As far as pottery industry is concerned, three principal ceramic industries *viz.,* red-slipped ware; a few sherds of Rouletted Ware and a number of fragments of conical bottomed amphorae in coarse red ware were found. Along with the pottery, a number of perforated tile and animal bone pieces, were also recovered. Other antiquities from the site included coins (tentatively datable to second-third century AD), beads and bone points. The semiprecious stone beads included carnelian, crystal, quartz, amethyst, agate and chalcedony; among these, quartz beads outnumbered the res.. A large quantity of iron slags and vitreous material were also found which indicate the lacal manufacture of iron implements as well as glass for making beads.

5. EXPLORATION IN DISTRICT PRAKASAM.— D.R. Raju and N. Chandramouli of the Department of Archaeology and Architecture, Telugu University, Srisailam, discovered two Palaeolithic sites in the Nallamalai hills of eastern Ghats near Srisailam.

Thummala Bailu (15° 58' N; 78° 58' E) is a *chenchu* settlement located 24 km south-east of Srisailam on the Srisailam-Dornala bus route. From an unknown past, *chenchus* were a food gathering primitive society and the inhabitants of Nallamalai.

On either side of the road between the *chenchu* settlement and a series of hillocks, a large Lower Palaeolithic site was discovered. The artefacts consisting of the Late Acheulian handaxes, cleavers, cores, scrapers, flakes, discoids, etc., were spread randomly over an area of 2 hectares approximately. Besides the hillocks towards left side of the road, there is a small hill stream. Here a large number of handaxes, cleavers, cores and other associated artefacts belonging to the Late Acheulian period, were found in a primary or semi-primary context. The raw material used was fine brownish quartzite. The artefacts were quite fresh indicating little displacement from the place of their abandonment. From the context it appears that the occupation was widespread in the region. Further explorations are likely to reveal more occurrences. There is a perennial spring, 2 km away from the *chenchu* settlement which has been a traditional source of water for the *chenchus.* This was perhaps the source of water for the prehistoric people as well. The vegetation in the vicinity is thick and rich in a variety of food plants yielding fruits, tubers, roots, nuts, leaves, mushrooms and also medicinal plants. Wild animal life consisting of mammals, rodents, avifauna, is also rich.

Pedda Mantanala (78° 50' N ; 16° 55' E), also a small *chenchu* settlement at the foothills, is located about 10 km south-west-west of Dornala on the left side of Dornala-Kurnool State Highway. Here lithic artefacts were found spread over a large area beside a lake which comprised miniature handaxes, unifacial and bifacial points, scrapers, borers, large flakes, blades and cores made on fine quartzite. The raw material was derived from the outcrops in the vicinity. The fresh water lake, perennial in nature perhaps acted as the source of water for the Stone Age people. The area is rich in wild plants and animal resources.

ARUNACHAL PRADESH

6. EXPLORATION IN DISTRICT UPPER SUBANSIRI.— B.J. Das of the Archaeological Cell of the Directorate of Research, Government of Arunachal Pradesh, carried out exploration in Daporijo (28° N; 94° E) in the northwestern part of the state. To trace the existence of Neolithic culture, the exploration was conducted around 20 sq km area of Daporijo proper including the villages of Nima and Dolam, Sikarijo, Ligo, Old Ligo, Manga and Dan areas (fig. 1) as there were found a few Neolithic artefacts earlier. The altitude of this area is 305 m MSL. Delimited by the rolling grassland of the District West Siang in the east and the south, the area embraces the great Himalayas in the north and lower Subansiri towards west. Daporijo is dominated by the people of Jani group, who according to the scholars, inhabited the region from time immemorial. Both in typology and raw material, these tools were different from those recovered earlier from Parsi Parlo in Kamla Valley.

BIHAR

7. EXPLORATION IN DISTRICTS HAZARIBAGH AND CHATRA.— S.B.Ota, assisted by N. Taher, S.M. Shambharkar, C.L. Yadav, Ghayasuddin and P.D. Satpute of the Prehistory Branch, Nagpur, of the Survey, carried out investigation around the known Rock-art site at Isko so as to ascertain the

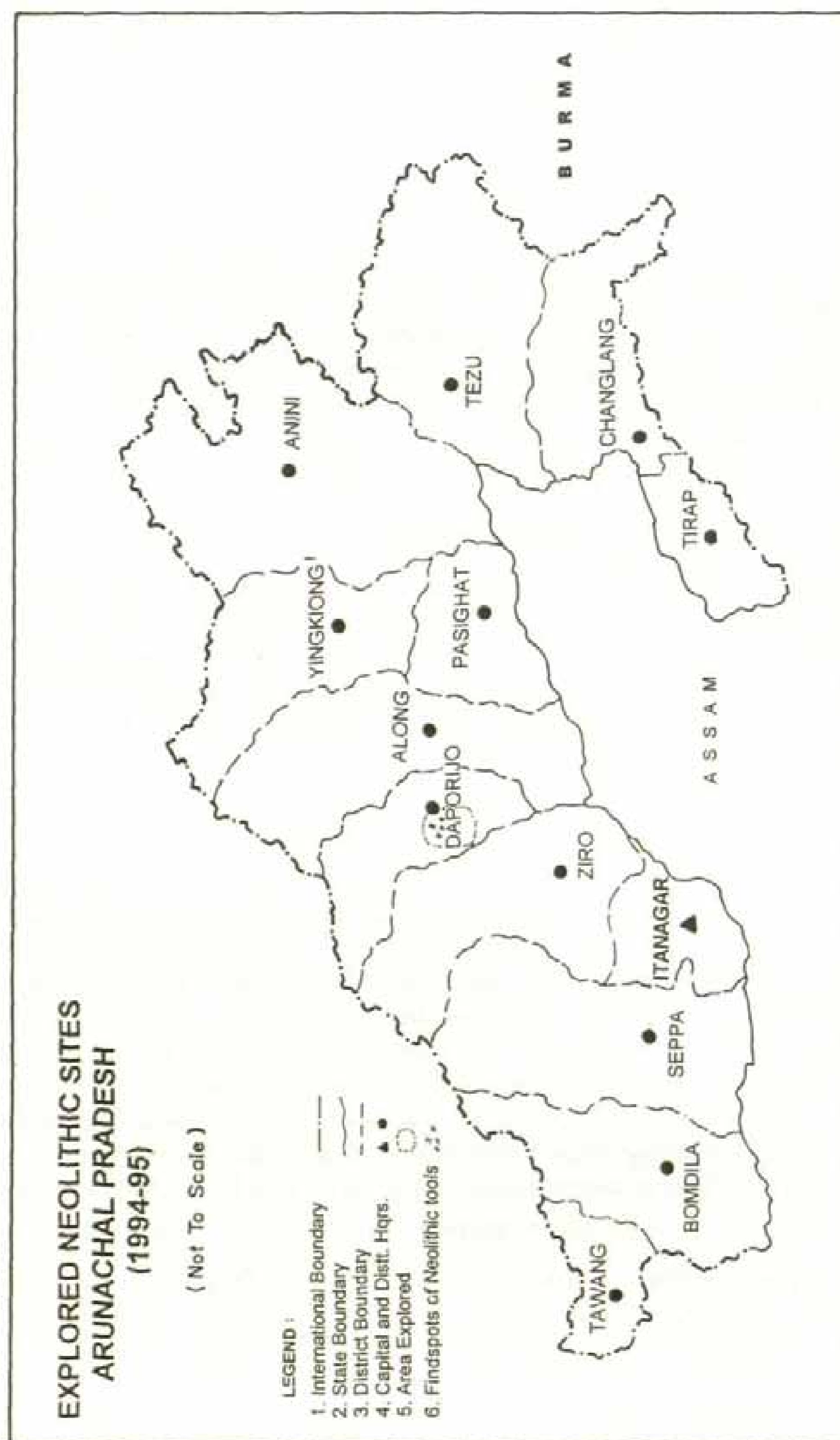

EXPLORED NEOLITHIC SITES
ARUNACHAL PRADESH
(1994-95)
(Not To Scale)
LEGEND :
1. International Boundary
2. State Boundary
3. District Boundary
4. Capital and Distt. Hqrs.
5. Area Explored
6. Findspots of Neolithic tools
BURMA
ASSAM
ANINI
TEZU
CHANGLANG
TIRAP
YINGKIONG
PASIGHAT
ALONG
DAPORIJO
ZIRO
ITANAGAR
SEPPA
BOMDILA
TAWANG

Fig. 1

archaeological potential of the region. In the course of investigation, the following sites were brought to light.

District	*Village*	*Nature of remains*
Chatra	Itkori	Temple remains, habitational mound along with a number of sculptural remains of Pala period
Hazaribagh	Binglat	Stone Age
-do-	Isko	Iron smelting site
-do-	Kanhari Pahar	Iron smelting site
-do-	Lepo	Megalithic
-do-	Nawatanr	Iron smelting site
-do-	Odarna	Megalithic
-do-	Pakri Barwadih	Stone Age
-do-	Sitagarh	Habitational mound; structural remains; iron smelting site and a few sculptural remains of Brahmanical and Buddhist pantheon
-do-	Tandura	Iron smelting site

Stone Age artefacts on quartzite have been identified at Pakri Barwadih and Binglat. Since the artefact distribution was meagre, it was difficult to assign the industry to any specific culture. However, some of the private collections from Chapri and Madwatari which were studied, indicated that further investigation around Isko might yield the evidence of Lower Palaeolithic.

Menhirs were found at all the Megalithic sites. At Odarna, pot-burials with remains of human bone were found associated with menhirs, which were exposed due to road cutting activity.

Historical sites at Sitagarh yielded evidence of three circular brick structures besides one habitational mound, while Itkori yielded temple remains alongside a huge habitational area. At both these sites were noticed the sculptures of both Brahmanical and Buddhist pantheon. At Itkori a large number of sculptures, majority of which comprised votive stupas, were noticed. These sculptures belong to the Pala period, and only a few of these are inscribed.

DELHI

8. EXCAVATION AT SALIMGARH FORT, DISTRICT CENTRAL DELHI.— The Delhi Circle of the Survey carried out archaeological excavations at Salimgarh fort (28° 39' 40" N; 77° 14' 35" E), under the direction of B.R. Mani, assisted by Urmila Sant, Vishnu Kant, R.K. Verma, Peeyush Bhat,

M.K. Batra, D.K. Bhardwaj, S.K. Dikshit, R.B. Chhetri, R.K. Sachdeva, G. Nageshwar Rao, Jagdish Chander and Suresh Chaudhary. The objective of the excavation was to know the cultural sequence of the site which was found to be a mound, encircled by the fort-wall in the sixteenth century AD, almost in similar fashion in which the Old Fort was constructed around the ancient mound of Indraprastha, about 6 km towards its south. The fort-wall of Salimgarh was constructed in *circa* AD 1546 by Islam Shah or Salim Shah, son and successor of Sher Shah Suri.

Trenches (10 x 10 m each) were laid and excavation was carried out in a limited area of Qds 1 and 3 of square Al. Digging continued down to the depth of 11 m from the top surface (pl.IA) and the natural soil could not be reached due to seepage of water. It was observed that during the time of construction of the fort, the undulated area was levelled by 6 m thick filling, composed of earth mixed with sand and stone chips. After filling up of the area, the surface was made even, over which the fort buildings were constructed. The rammed-floor belonging to the middle of the sixteenth century AD was found spread all over in the first quadrant which might have been a part of a huge courtyard of some building complex of original construction at Salimgarh. A part of random rubble-wall constructed over the rammed-floor datable to the Mughal period was also noticed. Remains of two more floors were noticed belonging to the successive phases of late Mughal period, the earlier having remains of a hearth. The top levels were found containing debris of the building material of Mughal period and antiquities and pottery of nineteenth century belonging to the Anglo-Mughal phase of Indian history.

After removing the thick filling, below the rammed-floor, was encountered the loam deposit containing washed out rolled potsherds of red ware, grey ware and Painted Grey Ware (PGW). Below this, was encountered the habitational deposit containing some pottery and animal bones which did not show signs of waterborne rolling of potsherds. The antiquity of such pottery takes back the date of the site to the early first millennium BC. The PGW sherds were found in late deposits also, possibly because of pit activities and levelling of the mound. Besides PGW sherds, Black-slipped Ware, black-and-red ware, grey ware and red ware were also found. Two copper coins of Sultanate period were found just below the rammed-floor of which one belonged to Sultan Balban (AD 1265-87). The Mughal ceramics included local glazed ware, Chinese porcelain, red ware containing typical decorated pottery. Evidence of Mughal glass ware was also noticed. Glass bangles, semiprecious stone beads, painted terracotta figurines, belonging to Mughal period, were also found. Among the important antiquities of nineteenth century, lead pendant with studded glass and tobacco pipes of white plastic clay were important. One of the pipes with human face contained inscribed English legends - Glasgow and Helmet (pl.IB). Thus the small-scale excavation provided evidence of occupation at the site from about 900 BC to the early historical age and after a gap again during the medieval period of Indian history to the present times.

Besides excavation, scientific debris clearance was also carried out for opening the blocked entrance on the northern side where in 1852 Bahadur Shah II, the last Mughal emperor, provided a gate that was closed during the British period by stone masonry and the inner area was filled up with debris upto a maximum height of about 7 m. A pathway connected with the gate and constructed of brick-on-edge masonry of *lakhauri* bricks of late Mughal period was exposed. Geo-Radar survey

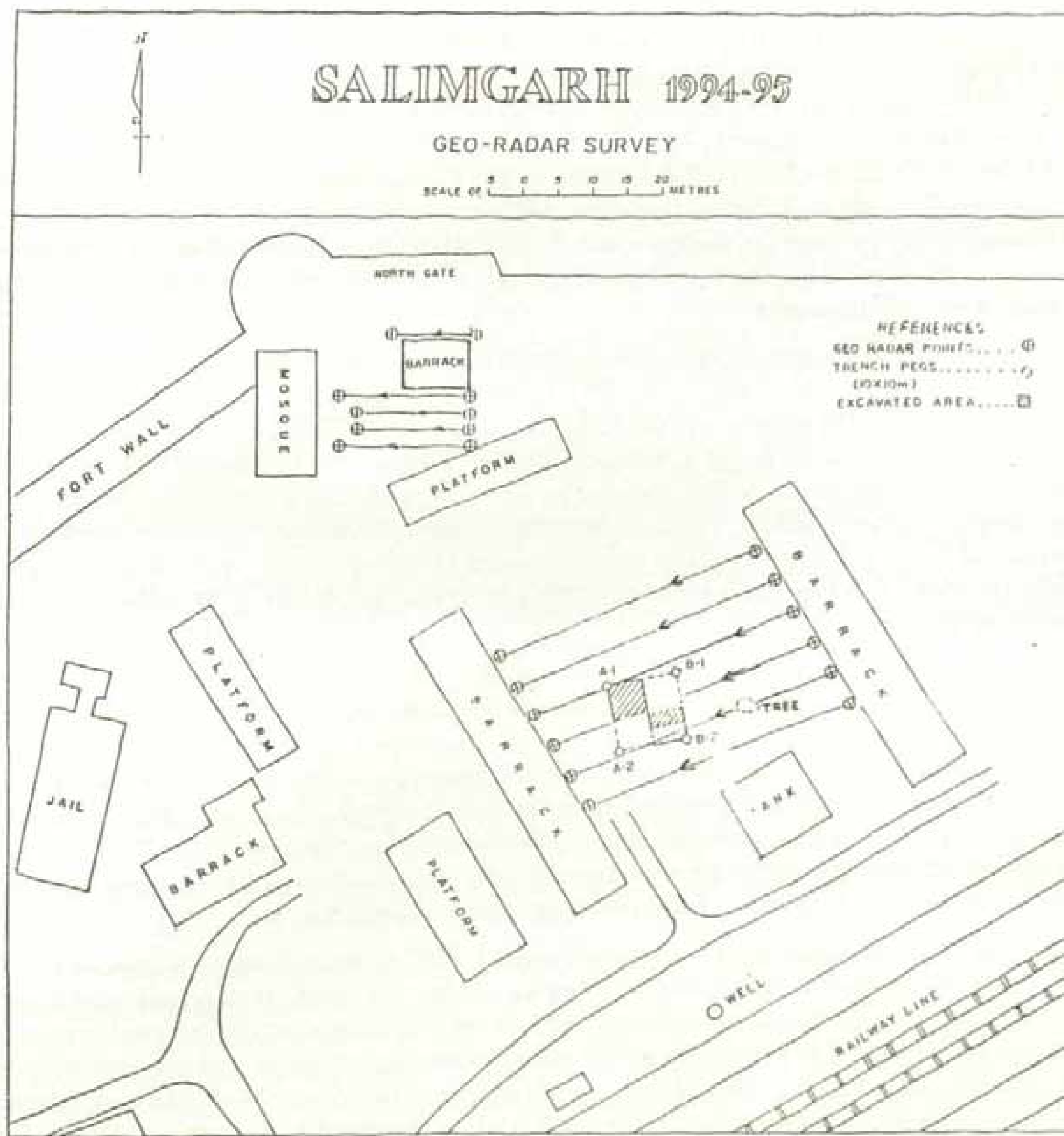

SALIMGARH 1994-95
GEO-RADAR SURVEY
METRES
NORTH GATE
REFERENCES
BARRACK
MOSQUE
FORT WALL
PLATFORM
BARRACK
PLATFORM
JAIL
BARRACK
BARRACK
A-1
B-1
TREE
A-2
PLATFORM
WELL
RAILWAY LINE

Fig. 2

in the central and northern parts of the fort was also conducted jointly (fig.2) with the help of Ground Penetrating Radar by the scientists of the Central Building Research Institute, Roorkee and the staff of the Delhi Circle of the Survey.

9. EXCAVATION AT LAL KOT AND ANANG TAL, DISTRICT SOUTH, NEW DELHI .— In continuation of third season's work (*Indian Archaeology 1993-94 - A Review,* pp. 13-25)[1], Delhi Circle of the Survey, under the direction of B.R. Mani, assisted by Urmila Sant, A.K. Khanna, Vishnu Kant, Purnima Ray, A.C. Chakravorty, M.K. Batra, D.K. Bhardwaj, S.K. Dikshit, R.B. Chhetri, R.K. Sachdeva, G.Nageshwar Rao, Jagdish Chander, Suresh Chand Sankhyan, Suresh Chaudhary, Sunil Kumar, Rajani Shankar and Sanjay Kumar resumed excavation at the citadel mound of Lal Kot and adjoining Anang Tal to get further idea about the material culture of Period I (Rajput period) and to expose further parts, particularly the eastern corners of the Anang Tal to know its constructional pattern from different angles.

Excavation was carried out in eight quadrants in LKT-1 — three at the citadel mound and five at the Anang Tal, i.e., Qds 2 and 3 of sq ZC 1, Qd 4 of ZC 4, Qds 1 and 4 of M 5, Qds 3 and 4 of P1 and Qd 3 of N1. The entire area of the Anang Tal was put to Geo-Radar survey which was carried out jointly by the Central Building Research Institute, Roorkee and the Survey with the help of Ground Penetrating Radar or Geo-Radar. The idea was to introduce non-destructive scientific methods in exploration and excavation for the study of hidden structures covered under accumulated debris and deposits. Electro-magnetic rays were transmitted deep into the earth and return signals were recorded for putting forth to the computers for getting the details of the buried structures including their plan.

Excavation was resumed in Qds 2 and 3 of ZC 1 where in the previous season, excavation was limited down to the depth of 7.30 m in layer 23, Qd 2. Excavation was continued down to the depth of 8.40 m below peg ZC 1 and down to the layer 29. For making enough space for excavation, the main baulk between the Qds 2 and 3 and some of the structures belonging to the Period II, were removed after their complete documentation. In the deposits of Period I, a series of floor levels were encountered which were either mud-floors or mud-floors mixed with lime finish. Two plastered drains were also noticed. Part of a door of stone masonry having random rubbles arranged with mud-mortar was noticed along with a floor, which was sealed by layer 20.

During the previous season, excavation in Qd 4 of ZC 4 was confined to the levels of Period II. This quadrant was also selected for deep digging and less important structures of Period II were removed after their careful recording to make enough space for deeper excavation which continued down to the depth of 6.30 m below peg ZC 4 and sufficiently good results were obtained from the levels belonging to Period I. Parts of walls and floors as above were exposed. Evidence of relaying floors was also found, sealed by layer 12 A (pi. II A). Hearth with ash was noticed, sealed by layer 17. At one spot remains of ochre painting were found over mud-plaster on the wall. In the area of Anang Tal, Qds 4 and then 1 of square M 5 were excavated to ascertain the layout of the southeastern corner of the tank. A compeletely different picture emerged in that corner as it was found that semi-

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[1]This publication is referred to in the following pages by the year only.

dressed stone-blocks, most of them having mason marks, were used in a stepped manner directly embedded in the natural soil. Their alignment further north and west was not traceable which could be located if further area is put to excavation.

As the northeastern corner of the tank provided interesting results in previous season, it was decided to expose further area downwards in that corner. Earlier it was noticed that from the top down to the depth of 1.80 m, in the corner part of the tank, a retaining wall with bricks arranged in stepped fashion and plastered with thick lime-mortar was provided, perhaps to avoid any leakage of water in the adjoining ground, over which, towards east of the tank, there must have existed a number of temples and other structures. This was also necessary for filling the crevices and gaps in the bed-rock and to make the surface smooth. The lower part of slopy lime-plastered retaining wall was merged in a broad landing. In the second stage, below the landing, a flight of twelve steps in both northern and eastern sides run downwards upto the second landing. The second landing was much wider in the east than in the northern side. These steps were made out of fully dressed rectangular stone-blocks having mason marks of bow and arrow or triangle and strengthened by iron clamps. They have the rise and tread of about 15 to 25 cm with a total height of about 2.40 m. To know further features of the tank from the north-east corner, Quadrant 3 of square N 1 with the mid baulk and Qds 3 and 4 of square P 1 were put to excavation. Digging operation was difficult and time consuming because of huge stone-blocks displaced from the tank and other structures of the surrounding area had fallen inside the tank. These were removed and very interesting features of the lower part of the tank were noticed. For increasing the volume of the tank, for safe and easy landing and descent as well as to break the monotony of structure by minimising construction work and beautifying it, six pyramidal steps were provided in different series in northern as well as eastern sides in different levels (pl.IIB;fig.3). These pyramidal steps were exposed between stages 2 and 4 beyond which no space was left in the trench to go further down. Between stages 3 and 4, a third less wider landing was noticed in the eastern side. Landing platforms of stages 2 and 3 have floors made out of stone slabs of various sizes. Since nothing much of stratigraphical importance was expected in the debris of the tank, further trenches could be opened and debris cleared in future to expose fully the important tank. The area towards east of the tank— the Qutb Archaeological area, was full of a number of Brahmanical and Jaina temples during the Tomar-Chauhan rule and therefore, the tank might have also been under the use of worshippers. This could be explained by the beautiful construction of flight of steps leading towards east and north sides of the tank.

During the course of excavation of the fourth season, two hundred and fifty-two antiquities were found. Among the important antiquities of Rajput period, mention may be made of a terracotta composite lamp, Ganesa figurine, two stick stands, rotering wheel with remains of two holes, handled incense-burner, arecanut beads, fragments of animal figurines, hopscoptch, potsherds with inscribed legends in Nagari characters of eleventh-twelfth centuries, four copper coins of horseman and bull type and pieces of glass bangles, usually black in colour. The headless *nandi* figure in sandstone (pl.IIIA), noticed in the previous season on the wall of Sultanate period, which obviously belonged to Period I, was removed from the wall. There were three dancing human figures or *ganas,* one in front of *nandi* and two on the sides. A few fragments of stone sculptures were also found

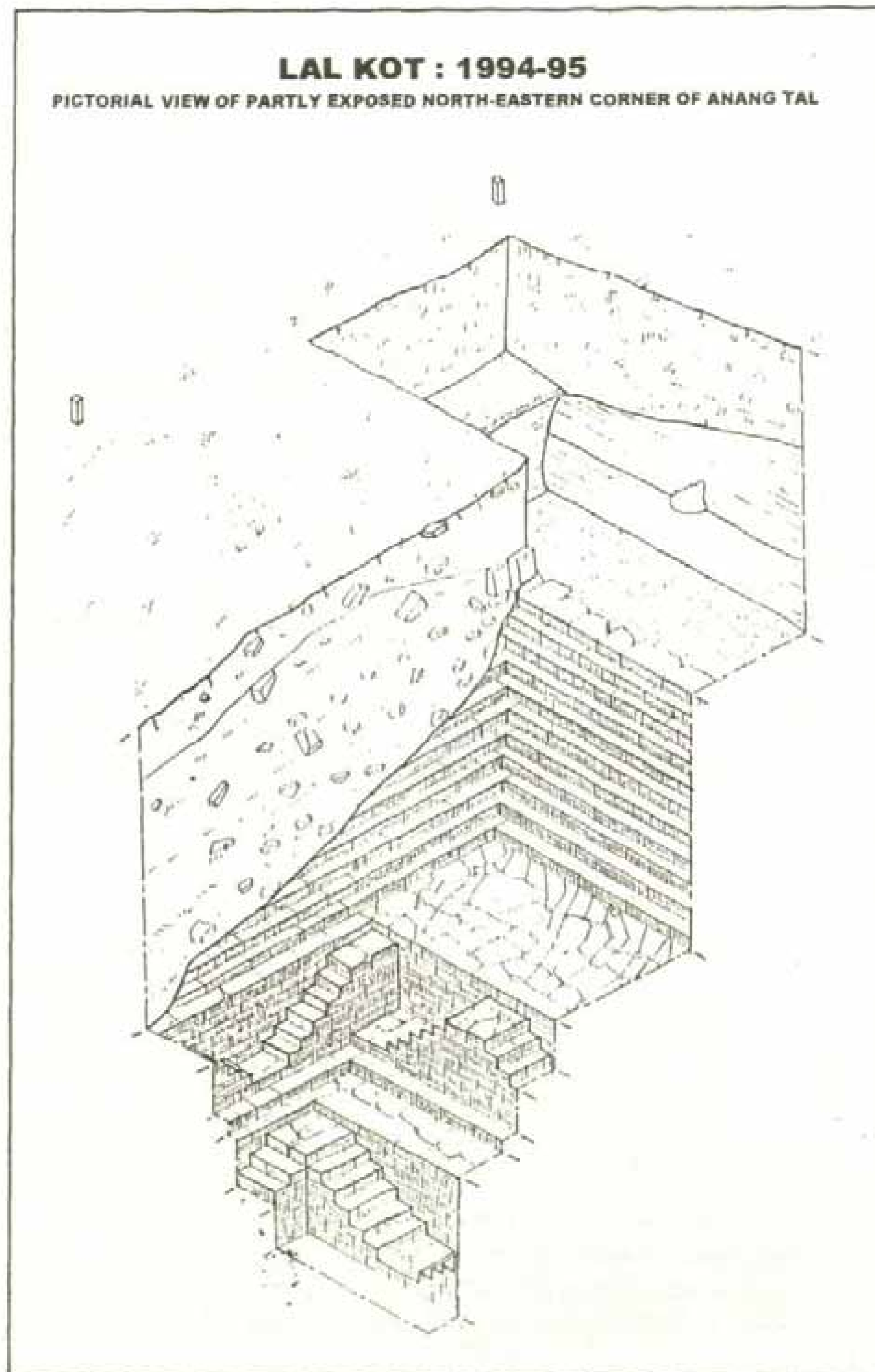

LAL KOT : 1994-95
PICTORIAL VIEW OF PARTLY EXPOSED NORTH-EASTERN CORNER OF ANANG TAL

FIG. 3

in the trenches in Anang Tal. Important antiquities of Period II included a glass ring, copper ring, copper bangles, thirty-one copper coins of early Delhi Sultanate and about fifty terracotta human and animal figurines, besides beads of semiprecious stones, glass and glass bangles. Ceramic assemblage noticed in the previous season's excavations were also found with similar shapes and fabrics. A red ware sherd with Nagari letters on its both the surfaces was also found (pl.IIIB-C) from the levels of Period I.

GOA

10. EXCAVATION AT ST. AUGUSTINE CHURCH COMPLEX, DISTRICT NORTH GOA, OLD GOA.— In continuation of the previous year's *(1992-93,* pp. 17-18) work, the Mini Circle, Goa, of the Survey, took up scientific excavation of St. Augustine church complex (74° E ; 15° N) at Old Goa under the direction of Muhammed. K.K assisted by M.R. Dhekane.

After the removal of vegetation, the southern half of the sacristy was further excavated, which revealed two vaulted rooms measuring 4.48 x 1.50 m and 4.42 x 1.05 m. The first vaulted chamber had one more tunnel inside it from which a lot of bone pieces of unidentified persons could be collected.

The excavation also exposed a side quadrangle measuring 8.10 x 8.00 m which served as the meeting point of the convent and southwestern way of the church. On the western part of it, two beautifully worked out holy water tanks measuring 1.60 x 1.90 m have been fitted into it. The tanks made out of fine basalt were decorated with shell designs. It also contained a triangular pediment.

A big staircase (2.70 x 10.90 m) led to the upper floor of the church, where a number of dormitories were exposed.

A door from the side quadrangle led to another room (8.00 x 4.30 m) — the exact nature of which could not be determined. Perhaps this might be one of the dormitories.

Important antiquities like Chinese pottery, iron nails, rectangular bricks, etc., were also collected from the site.

GUJARAT

11. EXCAVATION AT DATRANA, DISTRICT BANASKANTHA.— V.H. Sonawane, V.S. Parekh, P. Ajithprasad and P.C. Choudhari of the Department of Archaeology, M.S. University, Baroda, in continuation of the last season's *(1993-94,* pp. 25-31) trial-excavation, carried out digging at two adjacent sites at Datrana (23°46"N; 71°07"E) in Santalpur taluk. The excavation was planned with a view to understanding the features of the blade industry at the site *vis-a-vis* the mode of raw material procurement, its processing and production of lithic blades and beads. Besides, it also helped to check the stratigraphic position of the unique ceramic types unearthed in the last season from the site in relation to the ceramic types found from the adjoining sites.

A trench measuring 5 x 5 m adjacent to the last season's trial-trench was taken up at Datrana-IV (Hadka wala Khetar) in the current season. Excavation revealed virtually the same stratigraphic features reported earlier. The total cultural deposit at the site varying from 65 to 90 cm, belonged

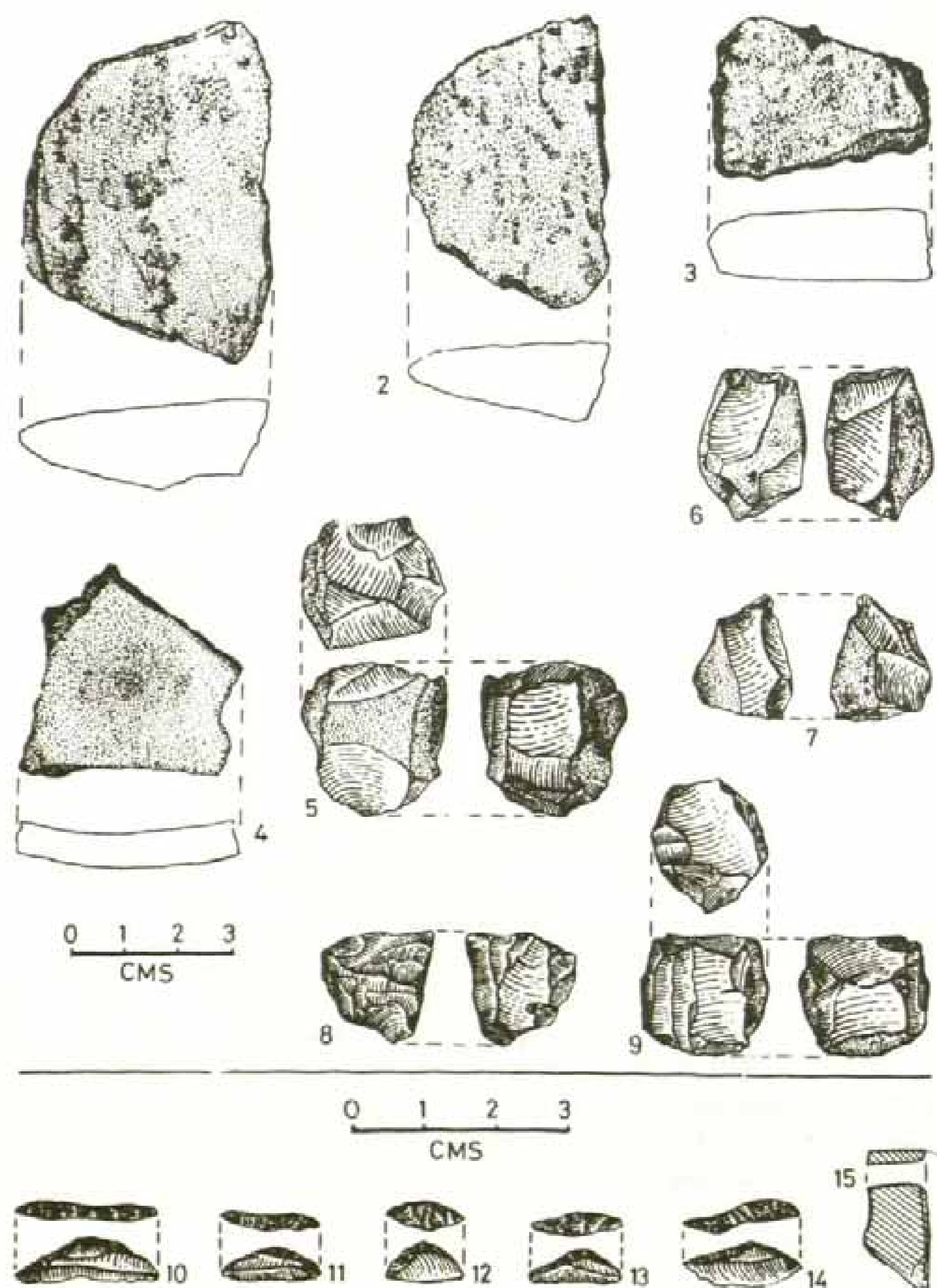


FIG. 4. *Datrana-IV : mesolithic tools*

to two distinct cultural periods: the Chalcolithic and Mesolithic. The Chalcolithic period was represented by a number of long blades (pl.IVA), crested ridge blades, prismatic blade-cores (pl.IVB), and considerable quantity of lithic industry debitage. There was also enough evidence for the production of small disc beads and tubular beads of agate and carnelian at the site in the form of bead preforms and discarded and unfinished ones (pl.VA). Besides, foliated and semi-cylindrical drill-bits of chalcedony and agate were also found in this deposit.

The pottery associated with this assemblage included a distinct type of black-and-red ware, a fine red ware, burnished red and grey wares. The latter two types have a peculiar incised pattern on them. Red ware with corrugated body and incised decorations were also common. These pottery types, comparable to the pre-Prabhas pottery, were also reported from Somnath in District Junagadh. In addition to these, some sherds of burial-type pottery reported from Nagwada and Santhli in Districts Surendranagar and Banaskantha respectively, were also found associated.

All these artefacts were found in discrete clusters, associated with heaps of animal bones. Many of these clusters included well finished tools, unused nodules, hammer-stones and small pieces of copper and therefore, it appeared to be the working area of individual stone knappers. Apart from these, the site revealed no concrete evidence of structural remains of this period.

Underlying directly below the Chalcolithic deposit was the Mesolithic deposit with a thickness of 50 to 60 cm, marked by the absence of long blades, crested ridge blades, cores and pottery. The lithic assemblage included crudely worked micro blade-cores, palette stones of sandstone and small backed tools like the lunates, triangle, trapeziums and points (fig.4). The most preferred raw materials for making lithic tools during this period were chert and jasper rather than chalcedony of the Chalcolithic period. The faunal remains collected from this deposit were fragmentary and relatively small in quantity. In addition to it, a large number of otoliths were also collected from the Mesolithic deposit, tentatively identified as three different varieties of marine fish.

Datrana-V (Patel nu Khetar) with a distinct concentration of artefacts, located about 300m north-east of Datrana-IV, showed a good concentration of microlithic tools, animal bones and pottery, indicating several features different from the Datrana-IV assemblage. A trench measuring 5x5 m was opened at this site for evaluating the distinct features of the assemblage as also for understanding its stratigraphic relationship with Datrana-IV

The excavation revealed a basic similarity in the stratigraphic sequence of cultures at both the sites. The Chalcolithic deposit measuring about 15 to 20 cm, represented by the base part of two large vessels were found *in situ,* and a few potsherd of similar vessels reported from the burials at Nagwada in District Surendranagar and from Santhli in District Banaskantha. Besides these two pots and a few nondescript long chalcedony blades, no worthwhile artefact of the Chalcolithic period could be obtained.

Underlying this was a Mesolithic deposit with a thickness of 60 to 70 cm. The artefact assemblage of this period included a large number of geometric microliths like the lunates (pi. VB), triangles and trapeziums and non-geometric ones like the points, borers and small scrapers.

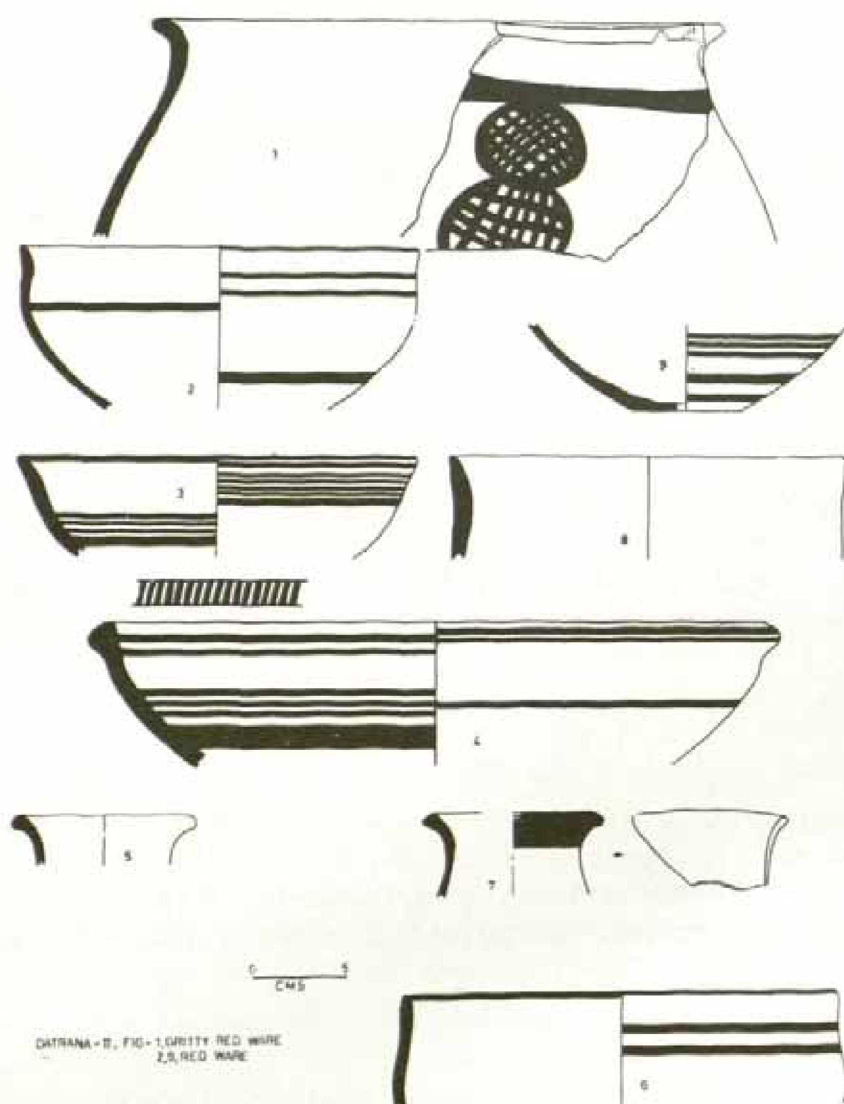


FIG. 5. *Datrana-II : pottery types*

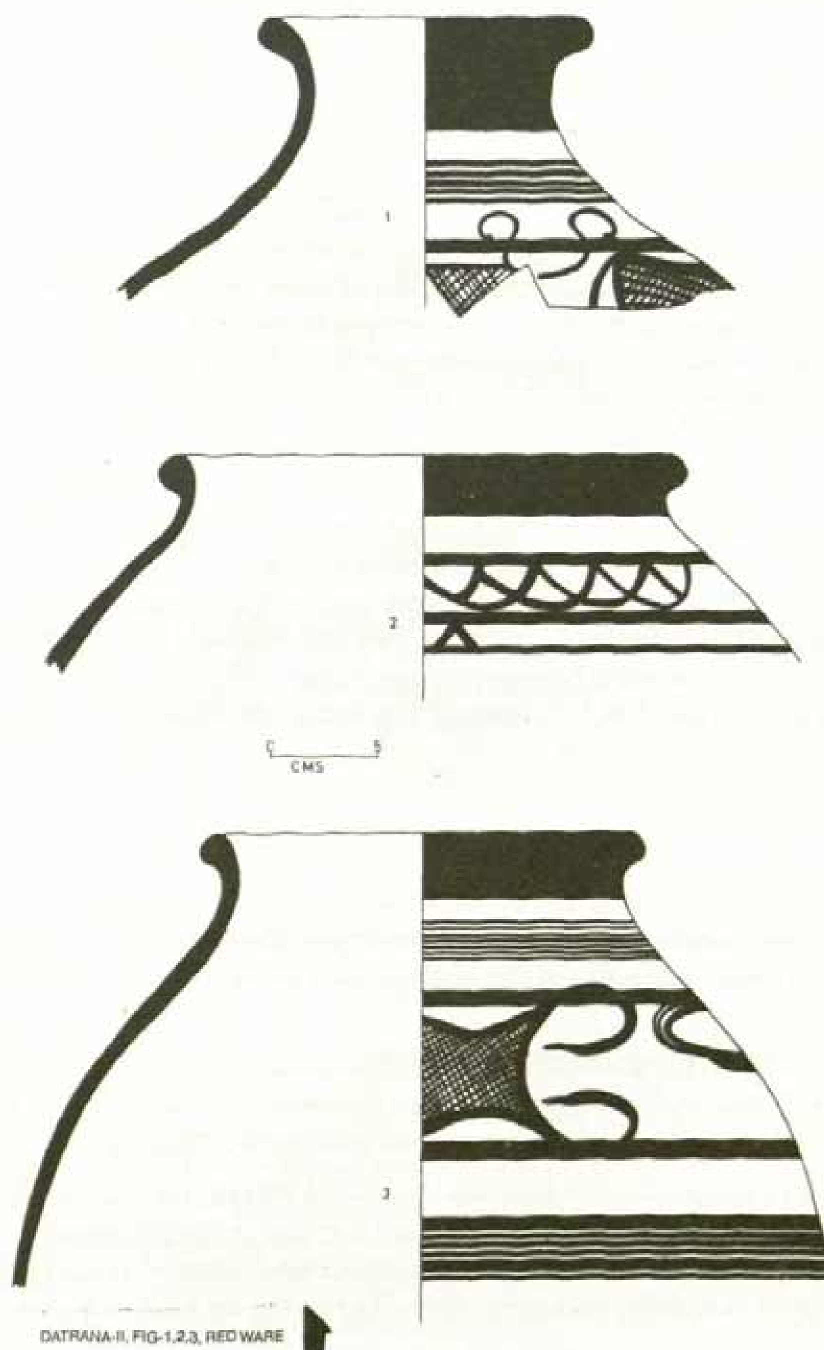


FIG. 6. *Datrana-II : red ware pottery types*

Chertjasper and agate were the lithic raw materials predominantly used in their production. A few hammer-stones, flat sandstone palettes, and red ochre crayons bearing grinding marks in association with fragmentary bones, horn-cores and teeth of exploited animals were also recovered from this deposit. The absence of prismatic blade-cores and crude blades in the assemblage was perhaps due to the less specialized lithic technology during this period than that of the Chalcolithic deposit. These features of the industry are however, comparable with the features of the Mesolithic assemblage unearthed at Datrana-IV, thereby indicating a stratigraphic correlation between the two.

Datrana-II (Ravechi mata no Timbo) is located about 1 km east of Datrana-IV, on a large stabilized sand-dune, flanked by two interdunal depressions at the southern and northern sides. The evidence of Chalcolithic occupation at this site was patchy and probably confined to the southern slope of the mound. A number of well made "Sorath Harappan" pottery and a few sherds of post-urban Lustrous Red Ware were collected from this site in the exploratory survey. Hence, excavation at this site was conducted primarily to check the stratigraphic relationship of this pottery with the unique pottery assemblage unearthed from the blade industry site at Datrana-IV.

The excavation at three carefully selected trenches, each measuring 5 x 5 m revealed a single period Chalcolithic occupation. Interestingly, habitation deposit in all these three trenches were confined to pits of different dimensions: the largest one, with a diameter of about of 2.00 m was 1.00 m deep, while the smaller ones measured hardly half a metre. These pits have yielded a rich collection of pottery most of which belonged to the well made "Sorath Harappan" pottery, analogous to the Rojdi - A and B types (figs.5-7). Made of very finely ellutriated clay, uniformly well-baked, these contained paintings of typical bull figures (fig.5) and other geometric designs. One of the pits in the excavation yielded a number of Lustrous Red Ware bowls, dishes and vessels with a corrugated neck, typical of the post-urban Harappan sites of Saurashtra. Similarly, most of the pottery recovered from a third pit was of gritty red ware and fine red ware belonging to the regional Chalcolithic ceramic tradition of north Gujarat. However, the unique types of pottery recovered from Datrana-IV, were not found in any of the trenches at this site. It appears, therefore, that these two sites are chronologically well separated and the occupation at Datrana-IV seems to be much earlier than Datrana-II.

Another interesting find was that of a pottery kiln, stacked with "Sorath Harappan'" pottery, especially the pots/jars, basins, bowls and dishes. Although no habitational structures could be located in the excavation, this might suggest a local production of pottery.

12. EXPLORATION IN DISTRICT BANASKANTHA.— V.S.Parekh, V.K. Sonawane, P. Ajithprasad and P.C. Choudhari of the Department of Archaeology and Ancient History, M. S. University, Baroda, carried out systematic exploration in Santalpur taluk, District Banaskantha, for locating Harappan affiliated Chalcolithic sites in this region. During this exploration nine new sites affiliated

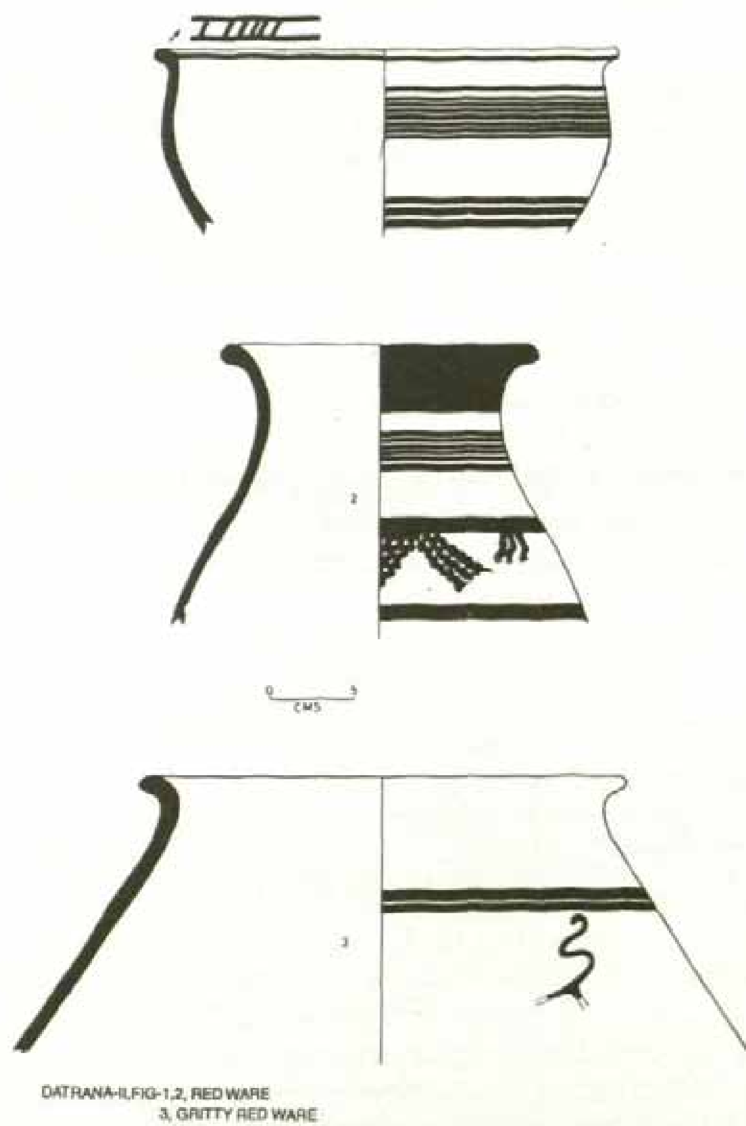


FIG. 7. *Datrana-II : pottery types*

to different phases of the Harappa culture in Gujarat were discovered. The details of their location, cultural affiliation and approximate size are given below.

Site	*Village*	*Nature of remains*
Kanthoda no thumdo (Mathutra-HI) (14 x 12m)		Late Harappan; Rangpur II B-C
Lakahar no thumdo (Ranmalpura-IV) (13x9m)		Late Harappan; Rangpur II C
Moda no thumdo (Ranmalpura-III) (65 x 48m)		Regional Chalcolithic; late Harappan, Rangpur II B
Pagiyawala no thumdo (Mathutra-IV) (11 x7m)		Late Harappan; Rangpur II B-C
Panchahari no thumdo (Ranmalpura-H) (12x9m)	Ranmalpura (23° 45'N; 71° OQ'E)	Late Harappan; Rangpur II C-HI
Randia no thumdo (Datrana-IX) (9 x 6 m)	Datrana (23° 46'N; 71° 07' E)	Late Harappan; Rangpur IIC
Talavadi no thumdo (Mathutra-V) (8 x 7m)		Late Harappan; Rangpur II C
Vadi talavadi no thumdo (Mathutra-II) (10x8m)	Mathutra (23° 44'N; 71° 05'E)	Burial pottery; late Harappan and Rangpur II B
Vanta no thumdo (Datrana-X) (22 x 17m)		Regional Chalcolithic of north Gujarat; late Harappan; Rangpur II B - C

13. EXCAVATION AT AMBAKUT, DISTRICT VADODARA.— P. Ajithprasad of the Department of Archaeology and Ancient History, M.S. University, Baroda, carried out excavation in one of the Mesolithic rock-shelters in the Sukhi valley. The site (22°29'N; 73°51'E), in the midst of a small granite hillock in village Ambakut, is about 1 km north of the Sukhi irrigation dam in Pavi-Jetpur taluk, District Vadodara. It is situated at a comfortable height of about 10 m from the surrounding

ground on a large rock promontory. Facing east, the rock-shelter is reasonably large with a five metre deep gallery and an opening of about 9.5 m.

The entire site within the shelter was first of all divided into four quadrants; each quadrant was then divided into 1.00 x 1.00 m grid after leaving a baulk in-between every two metres. Thus, the 1.00 xl.00 m trench formed the basic unit of excavation in the cave. The excavation covered a total area of 20 square metres.

The habitation deposit at the site belonged to two distinct cultural periods: the Mesolithic and the medieval. Since the actual floor of the shelter was slightly uneven and sloping down from the rear end towards the front, there was a corresponding variation in the thickness of the deposit within the shelter, which thus varied from 30 cm to 80 cm.

Stratigraphically the top 20 to 25 cm deposit in the shelter showed evidence of medieval occupation. A retaining wall of large granite blocks was built during this period and the enclosed area was filled with large stones to raise it as a small platform. This deposit, therefore, was mixed with a few microliths and medieval pottery. Underneath this, there was a 50 to 60 cm thick Mesolithic deposit in which three working levels could be identified on the basis of relative abundance of microlithic tools, grinding stones or flat sandstone palettes, hammers and anvils of the Mesolithic assemblage.

The microlithic industry included geometric tools like the triangles, trapeziums and lunates (pi.VI A) and non-geometric ones like the backed-blades, points, burins and variety of scrapers (pi. VIB). In addition to these, there were a number of cores, anvils and hammers of quartzite, quartz and a few sandstone palettes which might have been used as grinding stones. A number of red ochre nodules faceted due to grinding also formed part of the assemblage (pl.VII A). One of these red ochre nodules was ground from all sides so as to prepare a sharp needle-like point. It was also very hard and tough. Considering these attributes, it could be suggested that it might have been used as sharp point, just as any other microlithic point. Another interesting aspect of the industry was the presence of a number of heavy-duty tools made on large blades and flakes (pl.VII B). Although these large tools found at different levels in the deposit were generally abundant in the lower levels.

Quartz was the most abundantly used raw material throughout the Mesolithic deposit. A preliminary study of the distribution of raw materials in various levels indicated that the. relative abundance of quartz varied between 85% and 75% in all the levels except in the earliest level. In this early deposit measuring about 10 cm in thickness and lying just on the floor of the shelter, quartz tools were represented by 53%, and the remaining 47% was represented by other crypto-crystalline silicas like chert, jasper and agate. Natural formations of fine-grained chert, chalcedony or agate were not reported so far from anywhere in the valley or the adjoining regions. In the initial stage, these fine materials were perhaps brought into the valley from outside and only later, the Mesolithic settlers at the site started depending more and more on the locally available quartz. Moreover, the typical Mesolithic tools like lunates and backed-blades found in this early deposit were larger than the usuaJ ones, which incorporated a large number of heavy-duty tools made on large blades and flakes.

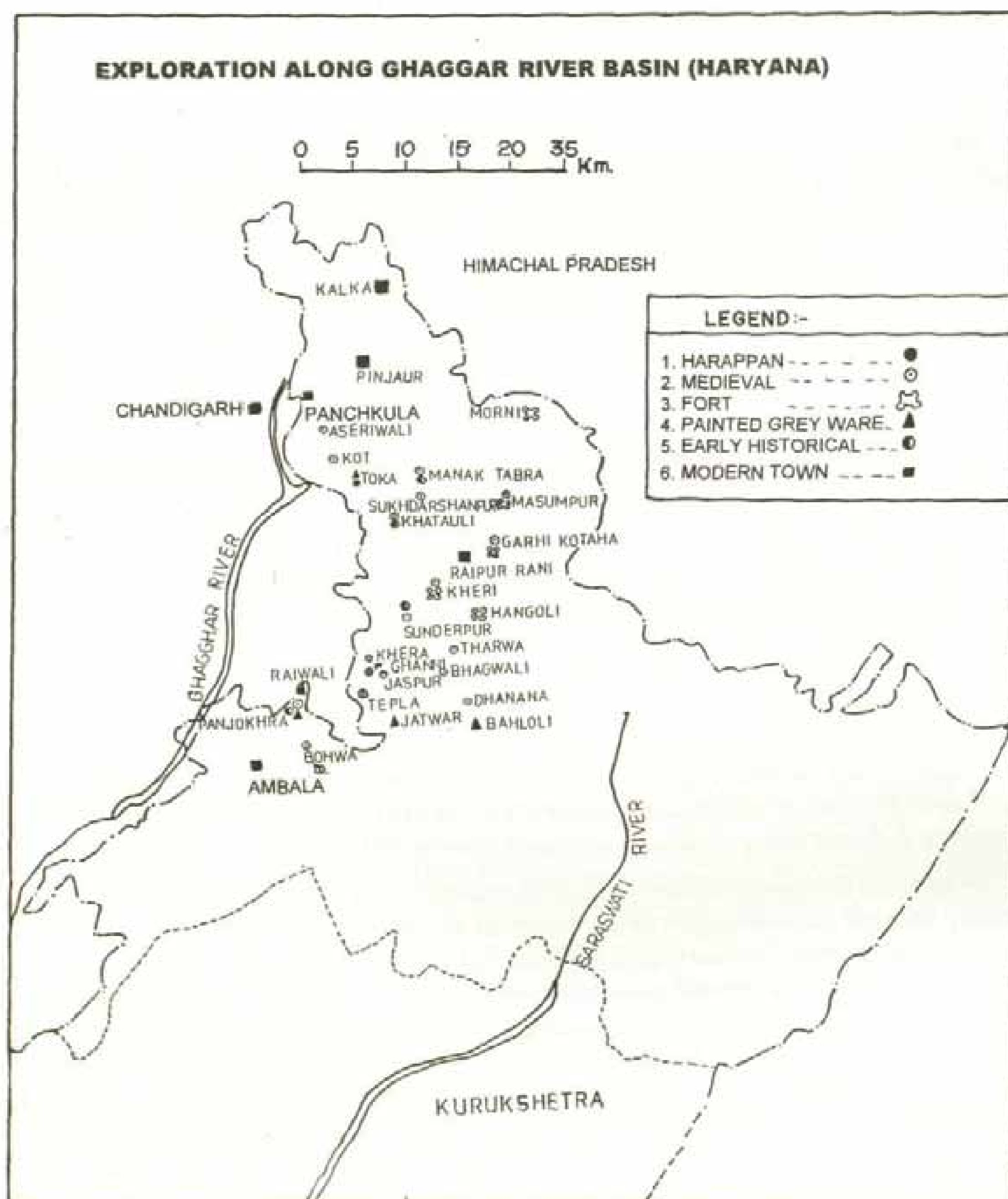

EXPLORATION ALONG GHAGGAR RIVER BASIN (HARYANA)
0 5 10 15 20 35 Km.
HIMACHAL PRADESH
LEGEND :-
1. HARAPPAN
2. MEDIEVAL
3. FORT
4. PAINTED GREY WARE
5. EARLY HISTORICAL
6. MODERN TOWN
KALKA
PINJAUR
CHANDIGARH
PANCHKULA
ASERIWALI
KOT
TOKA
MANAK TABRA
MORNI
SUKHDARSHANPUR
MASUMPUR
KHATAULI
GARHI KOTAHA
RAIPUR RANI
KHERI
HANGOLI
SUNDERPUR
THARWA
KHERA
BHAGWALI
JASPUR
RAIWALI
TEPLA
DHANANA
JATWAR
BAHLOLI
BOHWA
AMBALA
GHAGGHAR RIVER
SARASWATI RIVER
KURUKSHETRA

FIG. 8

No skeletal remains of the animals exploited by the Mesolithic community could be found in the entire excavation. It was not certain whether it was due to the chemical decomposition and subsequent degeneration of bones in an acutely acidic soil formed by the weathering of granite or due to some peculiar cultural behaviour of the Mesolithic community. The chemical analysis of soil and other sedimentary samples collected from the shelter might throw some light in this regard.

HARYANA

14. EXPLORATION IN DISTRICTS AMBALA AND PANCHKULA.— In continuation of the previous , year's *(1993-94,* pp. 45-47) work, P.K. Mishra, assisted by Jasmer Singh, Vinod Kumar, Baldev* Singh and Gauri Dutt of the Chandigarh Circle of the Survey, conducted exploration in Ghaggar basin covering the Districts of Ambala and Panchkula with a view to trace the Harappan expansion and PGW culture besides knowing their inter-relationship. Out of the seventy-two villages explored (900 sq m), only twenty-eight new sites were located, ranging from the Harappan to the medieval period (fig.8).

The village Garhi Kotaha, District Ambala, is situated on RaipurRani-Naraingarh road, about two and a half km south-east of RaipurRani and 14 km from Naraingarh. The ancient site (30°34' N; 77°03' E) is located on the south-west of the village Garhi Kotaha. The area of the site is about 4 to 5 acres and the height is about 6 metres from the surrounding area. The river Ghagghar flows 27 km west of the site.

The ancient site known as Mir Saheb Ka Qila now partly under cultivation, where exists a palacial building which is being maintained by the family members of Mir Saheb of Aligarh. There are remains of an old fort, now in ruins, with the fortification wall bounded by bastion and a small mosque in the centre. To the north-east of this ruined fort, almost about 100 yards, there is a huge stepped-tank enclosed by a boundary wall and an entrance towards south. The shapes of red ware collected from the site include storage-jar, bowl, dish, etc., indicating the site to be of medieval period.

The village Masumpur (3O°36' N; 77°05' E), District Ambala, approached by a link road from Garhi Kotaha, about 5 km north-east of village Garhi Kotaha, has a ruined fort on top of the hill, that is approached by a *kachcha* path about 1 km north-east of Masumpur. The small rectangular fort has a raised platform, built of stones and *lakhauri* bricks with the main entrance on the north. Besides some rooms and *tehkhana,* there were also noticed a few cells encircling the fort. The sherds of medieval red ware collected from the site include storage-jar, vase, basin, spouted-lid besides a base of a dish in grey ware.

The village Bhagwali (3O°3O' N; 77°00' E), District Ambala, is situated on Raipur Rani-Shazadpur road, about 7 km north-west of Shahazadpur. There is a temple dedicated to Siva at the ancient site (3 acres area), located in Bhagwali, approached by a *kachcha* path about 200 metres from the main road. The height of the mound is about 2 metres from the surrounding area. The river Ghaggar flows 22 km west of the site and the most part of the site is used for cultivation. The site yielded sherds of red ware which comprise vases, storage-jar, **lid,** bowl, etc., belonging to the medieval period.

The village Tharwa, Naraingarh tehsil, District Ambala, situated on RaipurRani-Shazadpur, is approached by a link road from Bhagwali, about 1 km north-east of village Bhagwali. The ancient site, located on the western side of the village Tharwa (3O°31' N; 77°01' E), is approached by a *kachcha* path, where exists a tomb known as Googapir. The area of the mound is about 4-5 acres and the height is about 5 metres from the surrounding area. The river Ghaggar flows 22 km west of the site. No antiquity could be collected from the site. The ceramic industry represented by red ware pottery of medieval period comprise vases, basin, storage-jar, lid, etc. Decorations in the form of notched designs, thumb impression, horizontal and vertical lines, paintings in black also occur on a few sherds.

The village Hangoli (30°32' N; 77°01' E) in Naraingarh tehsil, District Ambala, on the south of RaipurRani, is approached by a link road from RaipurRani-Barwala road, about 5 km from the main road. The river Ghaggar flows 22 km west of the village. There is bastion-/tower-like structure (h. 12 m; dia 27 m) in the centre of the village. The bastion is two-storeyed with the base made of *lakhauri* bricks in lime-mortar and the three sides of the bastion are almost intact. According to the local inhabitants there was a fort with bastion on four corners for security. This appears to be of the medieval/Sikh period.

The village Kheri (30°34' N; 77*00' E) in Naraingarh tehsil, District Ambala, situated on RaipurRani-Barwala road, which is 3 km west of RaipurRani town. The river Ghaggar flows 20 km west of the village Kheri. In the eastern side of the village there are ruins of small fort having four bastions on four corners. Three bastions are intact and one is in dilapidated condition. The fort is 2 metres high from the ground level. The distance between the two bastions is about 100 metres and the height of the bastion is about 12 metres and dia 27 metres approximately. The bastions are two-storeyed with an entrance from inside the bastion, built of *lakhauri* bricks in lime-mortar, almost contemporary to the Hangoli fort and could be assignable to Mughal/Sikh period.

The ancient site at Bohwa (30°17? N; 76°51' E), tehsil and District Ambala, situated on Grand Trunk road and 6 km south-east of Ambala cantonment, is approached by a *kachcha* path. The river Ghaggar flows 15 km west of the site and Dangri Nadi is about 1 km west of the site. The height of the mound is about 1-1.5 metres from the general ground level and the area is about 2 acres. The red ware pottery of medieval period collected from the site includes different shapes such as, vases, storage-jars, lid, bowl, etc., with designs in black comprising notched designs. Besides, a terracotta bead was also collected.

Morni (30°41' N; 77°05' E) in Naraingarh tehsil, District Ambala, is a small town, situated in the hills. It is approached from RaipurRani, connected with one *pucca* road from Nada village. The distance from Nada is 31 km while from RaipurRani town is 22 km. The small fort, situated on the top of the hill, has six bastions and two gates, one is from the east while the main gate, from the northern side, is now closed. The bastion in the south-west has collapsed but the remaining bastions are in good condition. Two rooms inside the fort are being used by the Department of Wild Life. The fort in stone masonry has the eastern gate renovated during modern times. There is a huge well in the centre of the fort, partially filled with debris. The fort seems to belong to the Mughal period.

The village Jaspur (30°29' N; 76°57' E) in Naraingarh tehsil, District Ambala, situated on RaipurRani-Jatwar road is about 14 km south-west of RaipurRani town. The ancient site on the northern side of the village, is about 3-4 acres and the height is about 2 metres from the ground level and the whole area is under cultivation. The ceramic industry represented by the sherds of medieval red ware which are thick and sturdy, bearing black paintings and notched designs. The shapes include storage-jar, pot, vases, lid, spout, etc.

The ancient site Khera (Ghanni) (3O°28' N; 76°56' E) is approached by a *kachcha* path from RaipurRani-Jatwar road, about 1 km south-west of the village Jaspur. A small tomb known as Guga Madi is situated near the site, the most part of which has been damaged due to the flow of Dangri Nadi. The area of the site is about 1 acre with a height of 1 metre. The river Ghaggar flows 14 km west of the site. The ceramic industry is represented by red ware vases, storage-jars, bowl, etc., of medieval period. A thick variety of grey ware and red ware pottery have also been collected from the site. The sherds of red ware are having horizontal and vertical lines, besides mat and notched designs.

The village Dhanana (30°26' N; 76°59' E) in Naraingarh tehsil, District Ambala, situated on Ambala-Shahjadpur road, is about 4 km east of village Chhajjumajra. The ancient site is situated near the main road and back side of the Khadi Ashram. The area of the mound about 4 acres with a height of about 2 metres, is still under cultivation. The river Ghaggar flows about 22 km west of the site. The ceramic industry is represented by red ware pottery of medieval period. The shapes include vases, storage-jar, lid etc. Thick sturdy red ware pottery bear black paintings mostly on the rim portion and on the outer side. Some potsherds are also having notched designs on the rim portions. A solitary sherd of PGW vase has also been picked up. Among the antiquities mention may be made of two arecanut terracotta beads.

The village Aseriwali (30°41' N; 76°57' E) in Panchkula tehsil, District Ambala is approached by a link road from Ramgarh-Barwala road. This road leads to Billa and Aseriwali, about 3 km from the main road. The ancient site, situated about 2 km north of village Aseriwali, is approached by a *kachcha* path. The site is on a ridge and the area is about 2 acres, which is being used for cultivation. The river Ghaggar flows six km west of the site. The ceramic industry representing the red ware pottery of medieval period comprise vases, basin, storage-jar, lid, etc. No antiquity was recovered from the site.

The village Bahloli (30°25' N; 76°57' E) in Naraingarh tehsil, District Ambala, south of village Dehri, is approached by a link road from the Ambala-Shahjadpur road. The ancient site, 1 km north-east of the village Bahloli, could be assignable to PGW period. The area of the mound is about . 4 acres while the height is about 2 metres from the surrounding areas. The river Ghaggar flows 20 km west of the site, the whole area of which is under cultivation. The shapes in PGW comprise deep bowl, dish, bowl, etc., while in red ware there are storage-jars, vases, basin, dish, etc.

The village Panjokhra (30°24' N; 76°50' E)) in tehsil and District Ambala, is situated on the Ambala-Handesra road, about 3 km from Handesra town. The ancient site is on the south of the village. The height of the mound is about 5 metres from the ground level and the area is about 1.5

acres. The river Ghaggar flows 10 km west of the site. The ceramic industry is represented by red ware of medieval period including storage-jar, vases, *handi,* lid, basin, etc. Only one copper coin has been found from the site.

The ancient site is situated on the Panjokhra-Khatauli road, about 3 km north of Panjokhra village (30°25' N; 76°51' E) in Ambala tehsil. The site is located in the land of Gurcharan Singh of village Panjokhra, close to the brick kiln of Shri Batra. The area of the site is about 2 acreswith a height of about 1-1.5 metres and the river Ghaggar flows 9 km west of the site. The ceramic industry belonging to the PGW/early historical period however, remains the same as represented by bowl, deep bowl, dish, etc., in PGW and vases, basin, storage-jar, lid etc., in red ware.

The village Toka (30°37' N; 76°59' E) in tehsil and District Panchkula,. situated on RaipurRani-Khangesra road, is about 6 km north-west of RaipurRani. Mound 1 is on the main road, south-west of the village Toka, near the brick kiln. The area of the mound, about 3 acres with a height of about 3 metres, is now under cultivation. The river Ghaggar flows 19 km west of the site. The ceramic industry is represented by the Harappan and PGW pottery. The shapes in Harappan pottery include storage-jar, dish-on-stand, vases, bearing horizontal and vertical lines and mat designs. The shapes of PGW include deep bowls, dish, etc. Besides, a few pieces of terracotta toys have also been collected from the site.

The Mound 2, situated on the right hand side of the road, is close to Mound 1 with an area of about 2 acres and a height of about 3 metres. It is being used for cultivation and levelled by the owner. The river Ghaggar flows 14 km west of the site. The shapes of Harappan pottery comprise miniature pot, dish-on-stand, bowl, *handi,* storage-jar, vases, etc., with the occurrence of horizontal and vertical strokes and mat designs. The shapes in PGW include bowls, deep bowls, etc., with designs like concentric circles, horizontal lines and so on. Antiquities collected from the site comprise terracotta fragmentary toys and bangles, besides a few pieces of faience bangle.

The village Khatauli (3O°35' N; 76°59' E) in tehsil and District Panchkula, approached from RaipurRani-Ramgarh road via Toka-Khangesra road, is about 2 km from the main road near the village Sukhdarshanpur. The ancient mound (1) is located at the east of the village and the river Ghaggar flows 18 km west of the site. The area of the site is about 2 acres with a height of about 2 metres. The ceramic industry is represented by early historical/medieval pottery. The shapes include vases, storage-jar, lid, bowl, *handi,* etc.

The Mound 2 is about *V2* km north-east of the village Khatauli with an area of about 3 m. The whole area of the site is under cultivation. The ceramic industry is represented by red ware of medieval period. The shapes include vases, storage-jar, bowl, *handi,* basin, etc. Some of the sherds bear decorations like notchings, etc.

The village ManakTabra (3O°36' N; 77°00' E) in tehsil and District Panchkula, approached by a link road from RaipurRani-Morni main road, is 2 km west of main road, near Gurudwara Manak Tabra. The ancient site is located on the south-east of the village in the cultivated fields. The river Ghaggar flows 20 km west of the site. The area of the site is about 3 acres with the height of about

2 to 3 metres. The ceramic assemblage, represented by red ware and a few sherds of plain grey ware, mostly belong to the early historical and medieval periods. The shapes include vases, storage-jars, lid, basin, etc. Besides some sherds of grey ware, Black-slipped Ware and red ware of medieval period have also been collected.

The site Sukhdarshanpur (3O°36' N; 76°59' E) is located on the Khangesra-RaipurRani road and north-east of village Sukhdarshanpur in tehsil and District Panchkula. The ancient site known as Paise wala is still used for cultivation. The height of the mound is about 2 to 3 m with an area of about 3 to 4 acres. The river Ghaggar flows 10 km west of the site. The ceramic industry is represented by red ware of medieval period. The shapes include vases, basin, storage-jars, bowl, etc. Only antiquity found here is a blackstone bead.

The village Kheri (30°34' N; 77°00' E) in tehsil and District Panchkula is situated on the west of RaipurRani-Barwala road, about 3 km from RaipurRani. The ancient site is located on the western side of the village Kheri. The height of the mound is about 3 to 4 acres. Most of the area is lying vacant. The river Ghaggar flows 20 km west of the site. The ceramic industry is represented by red ware of medieval period. The shapes include vases, storage-jars, basin, lid, *handi,* etc.

The village Jatwar (30°26' N; 76°55' E) in tehsil and District Panchkula on Rani-Jatwar-Ambala road, is 1 km west of the village and approached by *kachcha* path. The area of the site is about 3 acres and the height is about 1 to 3 metres. The river Ghaggar flows 16 km west of the ancient site. The exploration of the site yielded a variety of pottery, represented by PGW, plain grey ware, red ware and Black-slipped Ware. While the PGW shapes include bowls, vases and dish, the shapes in red ware comprise vases, basin, storage-jar and incence-burner. Besides, inkpot-type lids, tiny hand-made lamp having finger impressions inside the lamp along with a terracotta cylindrical bead have also been collected.

The village Tepla (30°27' N; 76°55' E) in tehsil and District Panchkula, situated 2 km north east of village Raiwali, is approached by a link road from Barwala. The ancient site is 1 km, east of village Samru on the bank of Dangri Nadi. The area of the mound is about 2 acres with a height of about 1 metre from the ground level. The area of the site has been levelled as the site is under cultivation. The river Ghaggar flows 16 km west of the site. The ceramic industry is represented by red ware pottery of medieval period. The shapes include vases, dish, storage-jar, etc. The site belongs to the late medieval period.

The village Raiwali Singhpura, situated 8 km south of Barwala town, is approached by a link road. The ancient site approached by a *kachcha* path is 1 -1.5 km north-west of the village Singhpura (Raiwali) (30°29' N; 76°55' E). The area of the site is about 2 acres with a height of about 2 metres from the ground level. The river Ghaggar flows 15 km west of the site. The ceramic industry is represented by PGW, red ware, plain grey ware and Black-slipped Ware. While the shapes in PGW comprise dish, deep bowls and miniature pots, the shapes in red ware show storage-jars, bowl, dish, lid, vases, basin, etc. Mud structures and brunt-bricks (25 x 22 x 9 cm) have also been noticed at the site. Among the antiquites collected from the site, terracotta ball, pendant and copper-ring are noteworthy.

The village Sunderpur (3O°35' N; 76°55' E) in tehsil and District Panchkula, situated 2 km north-west of Barwala town, is approached by a link road from Barwala-Derabassi road. The ancient site (Mound 1), located on the southern side of the village has been encroached by the local people. The height of the mound is about 1 acre. The river Ghaggar flows 13 km west of the site. The ceramic industry, represented by the sherds of red ware of early historical period, include incurved bowls, basin, dish, etc.

The Mound 2 is situated on the south-west of the village near Air Force Boundary. The area of the site, now under cultivation, is about 3 acres and the height is about 2 metres. The ceramic industry is represented by PGW and medieval red ware. The shapes in PGW include bowl, deep bowl and dish while the shapes in red ware comprise storage-jar, dish, bowl, *handi,* lid, etc.

The village Kot (30°37' N; 76°56' E) in tehsil and District Panchkula is situated on Ramgarh-RaipurRani road, about 300 metres south-east of the village on a hillock. The area of the site is about 2 acres. The height of the mound is about 7 to 8 metres from the ground level. The river Ghaggar flows 6 km west of the site. The ceramic industry from the site is represented by medieval red ware with the shapes like vases, incurved bowl, storage-jar, incense-burners, etc.

15. EXCAVATION AT KUNAL, DISTRICT HISSAR.— In continuation of the last year's *(1993-94,* pp. 47-50) work, J.S. Khatri and M. Acharya assisted by R.S. Dahiya, Kali Ram Saini, A.P. Jangra and Darbar Singh of the Department of Archaeology and Museums, Government of Haryana, Chandigarh, resumed excavation at Kunal (29°30' N; 75°41' E). The main objectives of this season's excavation were to investigate the nature and purpose of water-channel exposed in the previous year's work as well as to reveal more structures as also to ascertain the purpose of circular mud-brick structures of Period IB.

Trenches were laid out in the western, southern and eastern periphery of the mound. There was existence of 'V shaped water-channel close to the pre-Harappan habitation with a maximum depth of 3.45 m and a width of 4.15 m from the top. The two entrances of the settlement are on the southeastern and southwestern corners of the mound. The material from the deposit of water-channel contained a few sherds of PGW, associated black-and-red ware along with the pre-Harappan pottery. This water-channel, in all probability, might have served the purpose of a moat for protecting the settlement.

The circular structure (I) revealed five courses of mud-brick (11 x 23 x 39 cm) with an average depth of 1.18 m and an inner diameter of 2.70 m having a floor paved with mud-brick. The circular structure (II), cut into six working levels, also comprised five courses of mud-brick oi varying sizes (11 x 24 x 39 cm ; 11 x 22 x 37 cm and 22 x 23 x 39 cm). This structure including the mud-floor had a maximum depth of 1.12 m.

On the southern slope of the mound, a large area (6 x 8 m) with mud-brick edging, was found burnt which appeared to be a furnace of medium-size, the base of which was hard due to its constant use. There were some objects of copper *viz.,* three chisels, ring and an antimony rod found from the area.

The antiquities from the excavation included seals made of terracotta and shell, copper arrow-heads, blades of chert and chalcedony and gold bead in addition to the beads of carnelian, agate, lapis lazuli, faience and terracotta play-items.

The pre-Harappan pottery from Kunal with a variety of shapes and designs containing different shades of red and buff, is marked by black and white paintings besides geometrical, natural and animal motifs. Black-and-red ware was present throughout along with a distinctive grey ware bearing paintings in chocolate brown and white colours. A variety of graffiti marks were noticed on the pre-Harappan pottery.

16. EXCAVATION AT BALU, DISTRICT KAITHAL.— In continuation of earlier work *(1993-94,* pp. 50-51), the Department of Ancient Indian History, Culture and Archaeology, Kurukshetra University, Kurukshetra, resumed excavation in seventeen trenches under the direction of U.V. Singh, S.P. Shukla, Arun Kesarwani and B.K. Kathil. Of these, five trenches (DX1, EX1, FX1, CI and Nl) were partly excavated in previous seasons. The excavation was taken up in new trenches (GX1, HX1, 1X1, JX1, JX2, KX1, KX2, LX1, MX1, QX1, N5 and N6) with a view to trace the westernmost extremity of the mound and also to obtain evidence relating to the late phase of the pre-Harappan and Harappan cultures. A mud-brick fortification (width llm) was unearthed in DX1 and FX1 with nine courses of bricks. Above the pre-Harappan deposit (60 cm) was also exposed a mud-brick (30 x 20 x 10 cm) wall. This wall had a receding face on its outerside with extremely hard brick (16 x 16 x 7 cm) and clay casing. Below the pre-Harappan deposit was traced another mud-brick (30 x 20 x 10 cm) structure.

Almost in all the trenches above the Harappan remains, there was a deposit filled with ash, late Harappan pottery and antiquities, extending from DX Ext. to MX 1 at varying depth. The habitation of the period came into existence after spreading ash mixed whitish hard clay. Different floor levels and mud-brick walls made of fragile bricks (30 x 20 x 10 cm) were encountered in the excavation. In one trench, a room (2.5 x 1.45 m) possibly a store, was exposed. In-between MX 1 and LX 1, the remains of a *bhatti* were found on the surface itself. Another *bhatti* was located in the north side of Trench MX 1 with a few pots embedded in the ground, which were used for the purposes other than pottery baking.

The natural soil was reached in DX Ext. 1 only. The horizontal nature of layers in this trench indicated further extension of the original mound in the cultivated fields. The layers yielded terracotta cakes, pottery and fragments of *bhattis.*

A diagonally running drain (width 13 cm) from north-west to south-east was found exposed in Trench KX 3 on the surface itself. On its either side pots were found embedded in the ground, used either for draining out rain-water or for smelting. Excavation in Trench C Ext. 1 revealed the continuity of the wall, which was partly exposed in previous season *(1993-94,* p. 50).

Likewise, in continuation of the previous year's work, further digging in Trench N1, yielded the evidence of a house having been constructed twice on the same foundation. Several floor levels with evidence of successive habitation, one with the signs of burning, were noticed in this trench.

In order to gather more evidence about the pre-Harappan culture (phase A) at Balu, two trenches (N5 and N6) were laid. The excavation yielded the relics of this period with ash mixed pottery. The evidence of a partially exposed double oven was interesting. The Harappans built their houses on the pre-Harappan deposit in this area. There was evidence of a neatly built mud-brick house of the Harappan phase constructed subsequently on the earlier debris with a j ar used as a chute. Subsequently, another Harappan house was constructed with mud-bricks having a brick-lined enclosure for oven, and a semicircular enclosure in the north-west. The successive floors of burnt earth indicated the firing activity. In the floor of this house, a few broken baked bricks were found embedded, besides the traces of circular pits containing nodules and cakes.

The excavation yielded a variety of antiquities including terracotta, stone, bone, steatite, faience and copper objects in addition to a terracotta mould-like object, which might have been used for casting of metal objects. The pottery recovered from the site belonged to the pre-Harappan, Harappan and late Harappan periods. The late Harappan pottery displayed a variety of incised decorations. Charred-grains, weeds and wood samples, especially belonging to the pre-Harappan phase were collected by a team of Scientists from Birbal Sahni Institute of Palaeobotany, Lucknow, the study of which is likely to throw new light on the environment and food habits of the people. A sample of charcoal was also collected for determining the dates.

JAMMU AND KASHMIR

17. EXPLORATION IN LADAKH REGION.— In the course of exploration in Ladakh region, the Srinagar Circle of the Survey, located a number of rock-carvings depicting various hunting scenes, animal figures and remains of Dard Castles at Trangtse and Lukung area. Evidence of prehistoric period was also traced at ancient salt lake Tsokhar and Tsomoriri.

KARNATAKA

1 8-EXCAVATION AT HAMPI, DISTRICT BELLARY.— In continuation of the previous season's work *(1993-94,* pp. 54-56), K.P. Poonacha of the Bangalore Circle of the Survey, assisted by T.M. Keshava, T.P. Balakrishna Unnithan and Megharaj M. Hadpad resumed excavation at Hampi in three locations in a total area of 7000 sq m *viz.,* southwestern part of the Hazara Ramachandra temple; western part of the same temple and the eastern part of the openyard of the northern entrance to the Royal enclosure (stable).

Extensive horizontal excavation in 1,500 sq m area on the western and southwestern part of the Hazara Ramachandra temple revealed the remains of a long east-west running cyclopean wall with an entrance, basements of two squarish *sila-mandapas* and basement of two west facing temples (1 and 2) of modest size.

The cyclopean wall having east-west orientation was traced to a total length of 68 m. This wall (1.2 m) with a maximum height of 1.60 m, comprised three visible courses, built of wedge-shaped large granite blocks. It was constructed right over a rectangular platform (14 m north-south x 6 m east-west), which probably formed part of an original northern entrance to the mint enclosure. After the construction of cyclopean wall, the entrance went into disuse and a new entrance was

provided at the western end. The present entrance (3 m in width) is flanked by a rectangular *mandapa* (12.5 m north-south x 10.5 m east-west) on either side. Each of these *mandapas* contains three chambers of almost equal size. Extant height of the *mandapa* is 1.68 m with usual five mouldings of the plinth. The facing sides of the entrances, however, have provision for fixing the rearing *yalis* at regular intervals.

The Temple-1, constructed abutting the western *prakara-wall* of the Hazara Rama temple with a square *garbhagriha* (1.7 x 1.7m), was preceded by a square *ardha-mandapa* (6 x 6 m) on the west. Interestingly, the sanctum walls were built about 70 cm away from the *prakara* of the Hazara Ramachandra temple and the resultant gap filled with rubble and earth, was plastered subsequently. The front *mandapa* extant only upto the basement level was austere in elevation whereas only the inner veneering of the sanctum found intact.

The Temple-2 was built abutting the western *prakara-wa* of the Hazara Ramachandra temple at a distance of 2 m south of Temple No. 1. The temple comprised on plan a square (1.9 x 1.9 m) *garbhagriha,* flanked by smaller sub-shrines on either side, a squarish (7 x 7 m) *ardha-mandapa* and *sabha-mandapa* of equal dimension with a sill and a flight of three steps on the western side. The *ardha-mandapa* was internally indented so as to form the two sub-shrines and a provision at south to form *ajagati* whereas at north, the remnants of a brick-built and plastered *devakoshtha* has been encountered with a *pada,* an *adhokumuda,* a *kantha* and an *urdhvakumuda.* The *sabha-mandapa,* however, was extant only upto the *pada* moulding. Four pillar-bases of the central *ankana* of *sabha-mandapas* were also found *in situ* (pi.VIII A).

Atleast three successive stages in expansion of the plan of this temple could be discerned. The *garbhagriha* erected over the apron-like stone-pavement of *the prakara,* marked the first stage. The addition of an *ardha-mandapa* forming the sub-shrines, with peripheral platform on the southwestern corner and *kakshasana* on the other sides, characterized the second stage. Similarly, the addition of the closed *sabha-mandapa* with a flight of steps on the west and introduction of squarish *balipitha,* formed the third and final stage. An eight-lined inscription, engraved in three parts of a large dressed rectangular granite-block, unearthed outside the *sabha-mandapa,* in Kannada script and Sanskrit language, records the genealogy of the early Vijayanagara kings upto Narasanayaka in the usual phraseology and pattern of copper-plate charters of Krishnadevaraya's period. This inscribed stone-block, perhaps formed part of the outer veneering of the northern wall of the *sabha-mandapa,* indicated the third and final stage of expansion of the temple, co-eval with the reign of king Krishnadevaraya.

To the south-west of the *sabha-mandapa* of Temple-2, almost abutting north of the cyclopean wall, the basement of a large ruined *mandapa* was traced. This squarish *sila-mandapa* (7 m east-west x 6 m north-south) extant only upto the basement level, accomodated sixteen pillar bases arranged at a regular interval of 2 m and formed nine *ankanas.* At the geometric centre of the *mandapa* was found a rectangular (1.50 x 0.66 m) granite pedestal with a central squarish socket, obviously to accommodate the tenon of an image bearing a three-lined inscription on its northern

face. The three-lined inscription engraved in Kannada script and language of fourteenth-fifteenth century reads (pi. VIIIB):

Sri Vira-Harihara Raya na

maneya Jagadi Tippa Uda-

ya madisida prati [sthe*],

This (probably the image of Bhuvanesvari retrieved near the pedestal) was got installed by one Tippa Udeya, in the premises of the residence of Sri Viraharihara Raya. The inscription unambiguously establishes the existence of the palace of Vira Harihararaya (i.e., Harahara I, AD 1136-1379) in the near proximity of this *mandapa.*

From this area near the flight of steps of the *sabha-mandapa* of Temple-2, and in front of the above referred *mandapa,* where the image was originally installed by Tippa-Udeya, was retrieved an almost round sculpture of a four-handed seated Devi (0.65 m in height) in granite. The goddess seated in *ardha-padmasana* (pl.VIIIC), with cherubic face and a third eye on the forehead, wears *kirita-mukuta* containing usual ornamentation in conformity with the early Vijayanagara art. Of the four hands, the lower right and left hands are in *abhaya* and *varada* poses while the upper right and left hands hold *pasa* and *ankusa* respectively.

To the further west of the Tippa-Udeya's *sila-mandapa,* another sixteen pillared square *silar mandapa (Sila-mandapa - IT),* slightly larger in dimension was exposed. The *in situ* pillar inscription in Kannada characters and language (pl.IX A), records the date of its construction as AD 1517, during the reign of Sri Krishnadevaraya. It also refers to a certain Timmoja, son of Pampoja, the carpenter of the palace.

This excavated and restored *mandapa* at present, has only two courses of *adhishthana* mouldings in the form of *pada* and *adhokumuda.* The extant *mandapa* measures 8.50 x 8.50 m in four bays forming nine *ankanas,* the distance between two pillars being 1.80 m. The thirty-lined pillar inscription, referred to above, is located towards the southwestern corner of the central *ankana.*

Excavation in the western part of Hazara Ramachandra temple to the north of terraced structure (Royal court), revealed an entrance (1.45m) to the west of guard platform of the terraced structure, which opens into a spacious open courtyard (24.10 x 12.25 m), through a transcepted passage (6.25 x 5.00 m). In the northeastern corner of this courtyard, a toilet-block of 5.80 x 5.40 m was encountered, for abutting the north-south and east-west running screen-walls of the courtyard. The toilet-block was divided into three chambers (pl.IX B). The seat of the toilet was found attached to the north-south running screen-wall and was compartmentalised with other chambers with the help of a 'L' angle screen-wall measuring 1.80 x 2.40 m. Succeeding the toilet proper was an ante-chamber (4.85 x 2.90 m). Built in uncoursed rubble-masonry set in mud-mortar, the toilet was lime-plastered. Different parts of a brass-lamp were retrieved from the wash room adjacent to the toilet.

The clearance to the west of this courtyard, laid bare the residential quarter divided into two equal units, the northern and southern wings, enclosing guarded east-west running passage (8.30 x 1.75 m). A door was provided at 3/4th distance towards the west in the passage and the door sill

having a width of 0.45 m. At the east, this passage opens into a gallery, which in turn, opens into the courtyard and at the west it leads into a closed courtyard (5.64 x 5.55 m). Another passage (4.15m) at right angles to east-west passage, to the north of closed courtyard was encountered with a provision for door, similar to the earlier one and opens into a pillared gallery (5.50 x 3.75 m) at north. Excavation yielded wooden square post-holes also placed at a distance of 2.90 m. The squarish closed courtyard at its southwestern corner had two flights of steps (0.95 x 0.27 x 0.24 m), the structures to which it leads at west, were greatly disturbed.

The entire superstructure of the residential quarters was highly disturbed. The extant structures available upto the *moulded-adhishthana* comprised only the *pada, adhopadma, kantha, pattika* and *adhopadma* in that order. Even these conventionally ornate mouldings, were once plastered. Extensive charcoal found close to *adhishthana-mouldings* suggest some burning activity. Easternwing of the residential quarter had two flights of steps facing south and east respectively in close proximity to each other. Interestingly, a tall brass lamp (86-90 cm) placed on brass-plate was found between these steps so as to lighten both the steps.

Excavation in the eastern part of the open courtyard of the northern entrance to the Royal enclosure by removal of baulk and debris, yielded remains of a horse stable. The work which was mainly concentrated on the southern side, revealed the plan and elevation of rectangular hall with water troughs.

A number of antiquities including lithic records, sculptures, beads and metal objects were recovered. Of the three inscriptions, one in Sanskrit language was fragmentary. One engraved on three faces of the cubical part of a pillar, dated AD 1517, refers to the construction *of as ila-mandapa* by one Timmoja, son of a renowned blacksmith of the palace whereas the third refers to the installation of a deity in *sila-mandapa* in the area *(jaga)* of Harihara Ray a's palace. Among the stone sculptures, the four-handed seated form of Bhuvanesvari and a relief sculpture of Hanuman are noteworthy. A beautifully worked but mutilated miniature sculpture of crawling ba/a-Krishna in soapstone is yet another important discovery. The other antiquities retrieved include rings and coins of copper, broken pieces of two brass-lamps, beads of terracotta and semiprecious stones and mutilated stucco figures of birds and geometrical figures which once decorated the interior door-frame of the Temples 1 and 2.

Besides the above antiquities, considerable amount of medieval ceramics, black-and-red ware, grey ware etc., were also unearthed.

The exposed structures in the area west of the Hazara Ramachandra Temple were duly conserved. The cyclopean screen-wall with a *mahadvara* bifurcating the Rangamahal complex on the south and Vira Harihara Raya's palace (Dannayaka's enclosure) on the north was restored to a length of 68 m, in east-west orientation and to an average height of 1.60 m using the available huge wedge-shaped granite blocks. The core of this wide screen-wall (1.20 m) was filled with alternate courses of rubble and earth. The entrance provided on the western end of this wall and adjoining the *sila-mandapas* were also reset following the original plan and elevation, utilizing the available architectural members (pl.X).

The basements of the two *sila-mandapas* and the *sabha-mandapa* of Temple 2 were reset as per original plan and elevation, using the available architectural members. All the available fallen pillars were re-erected to plumb in their original position. The mutilated sculpture of Hanuman retrieved from the debris near Temple 1 was mended suitably and housed in the said temple. The fragment of the decorated monolithic stone door in the area near the northern entrance to the Mahanavamidibba were carefully mended (pi.XI) and is being repositioned near the entrance.

The undulated area around the above structural remains as well as open courtyards were completely levelled by filling alternate courses of rubble and earth maintaining requisite gradient to drain off the rain-water.

19. EXPLORATION IN HOSPET AND KUDLIGI, DISTRICT BELLARY.— In the course of village-to-village exploration in Hospet and Kudligi taluks, W.V.S. Narasimham of the Bangalore Circle of the Survey, discovered the following antiquarian remains.

Village	*Nature of remains*
Amaradevaragudda (14 54'30"; 76 25'00")	Fort of late medieval period
Ammanakeri (14 52" 30"; 76 25' 30")	Hero-stone of Vijayanagara period; fort of late medieval period at Gubbinagudda
Basapuram (15 04' 00"; 76 20' 00")	Irrigational tank with a Kannada stone inscription of AD 1539
Belagoduhalu (15 26' 00"; 76 37' 00")	Dilapidated temple of Vijayanagara period ; hero-stone of post-Vijayanagara period
Bukkasagaram (15 21'00"; 76 32'00")	Five Kannada inscriptions of *circa* sixteenth-seventeenth century (one is dated AD 1524); dilapidated temples, stepped-well and a *mandapa* with a passage of Vijayanagara period; hero-stone, .sari-stone and a fortress of post-Vijayanagara period; a boulder with eroded ochre paintings
Chikkajayiganuru (15 21' 30"; 76 40' 00")	A Kannada stone inscription at Kallugudi (AD 1522)
Chilakanahatti (15 04' 30"; 76 21' 00")	A Kannada stone inscription (AD 1559); two copper plates with Kannada inscriptions of *circa* sixteenth-seventeenth century; four hero-stones of post-Vijayanagara period
Devalapuram (15 17' 00"; 76 39' 00")	A stone-slab with sculptural representation in low relief of Vijayanagara period; an ancient irrigational tank bund

Village	Nature of remains
Devasamudram (15 21' 00"; 76 38' 00")	Renovated Lakshmi-Narayana temple and a highly mutilated hero-stone of Vijayanagara period
Gonahalu (15 18' 30"; 76 41' 00")	Inscription, two hero-stones and two weathered sculptures of Vijayanagara period
Hampadevanahalli (15 19'30"; 76 41'00")	Two Kannada stone inscriptions, hero-stone and two sari-stones of Vijayanagara period
Haravanahalli (15 05' 00"; 76 19' 00")	*Mandapas/temples* with well, irrigational tank and Kannada inscriptions of late medieval period
Javuku (15 19' 00";76 40' 00")	Mutilated hero-stone of post-Vijayanagara period
Jiriganuru (15 19' 00"; 76 40" 30")	Two dilapidated shrines and fragmentary sculpture of medieval period
Kakkuppi Virupuram (hamlet) (14 52' 00"; 76 26' 30")	Three hero-stones of post-Vijayanagara period
Kampli (15 24' 00"; 76 36' 00")	Temple of Somesvara, loose sculptures and fort of medieval period; temple of Pampapathi and two Kannada stone inscriptions of Vijayanagara period and hero-stones of post-Vijayanagara period
Kanavatimmapuram (15 21' 00"; 76 34' 30")	Irrigational tank, ruined fort, temple, Kannada inscriptions, loose sculptures and hero-stones of Vijayanagara and post-Vijayanagara periods
Kuppana kere (14 54'00"; 76 21'30")	Loose sculptures of medieval period
Metri Chinnapuram (15 18' 30"; 76 37' 30")	A disturbed ash-mound; hero-stone (?) of Vijayanagara period; irrigational tank bund and mutilated hero-stones of post-Vijayanagara period
Muddapuram (15 25' 30"; 76 40' 30")	Renovated Venkataramanasvamy temple and loose sculptures of Vijayanagara period; a Kannada inscription on a stone slab (AD 1542)
Muddapuram (15 23' 30"; 76 40' 30")	Irrigational tank of post-Vijayanagara period
Nandibanda (15 08'30"; 76 19'00")	Kannada inscription on a boulder (AD 1387) and an irrigational tank with Kannada stone inscription (AD 1554)

Village	*Nature of remains*
Potalakatte	Five irrigational stone tanks still in use, two of them bear Kannada inscriptions (AD 1554)
Ramasagaram (15 22' 30"; 76 34' 30")	Temple of Nagaresvara, a *mandapa,* fragmentary Kannada inscription, hero-and raft-stones of Vijayanagara/post-Vijayanagara periods
Sanapuram (15 26' 30"; 76 39'00")	Virabhadrasvamy temple of Vijayanagara period
Somalapuram (15 16'30"; 76 16'30")	A stone inscription in Kannada language and script of post-Vijayanagara period
Sugganahalli (15 18' 00"; 76 41" 00")	Loose sculptures and three hero-stones of medieval period
Upparahalli (15 17 30"; 76 17" 30")	A gateway with fort-wall of Vijayanagara period
Timmalapura (15 02'30"; 76 21" 30")	Temples, ruined gateway and inscriptions of Vijayanagara period
Ittigi (15 27'00"; 76 40" 00")	A stone inscription in Kannada of Vijayanagara period

20. EXCAVATION AT HEGGADEHALLI, DISTRICT COORG.— The Department of Archaeology and Museums, Government of Karnataka, Mysore, conducted excavation at Heggadehalli in Somwarpet taluk with a view to exposing the Megalithic burials which were surveyed as early as in 1856 by the scholars like Moegling, Mackenzie and Cole. Although the Department of Ancient Indian History and Archaeology, University of Mysore, under K.K. Subbaiah exposed a few burials, no proper attention was given to these discoveries and as such the existence of these discoveries remained unknown.

Situated at the foot of Jenukallubetta (rocky hill of the honey), this extensive Megalithic site is about 3 km away from the little town of Kudige and the river Harangi, a tributary of Kaveri which flows close to the site. Here hundreds of Megalithic graves including stone circles, cairn circles and cists were located. Out of these only twelve graves were taken up for excavation. The cist burial, laid in *svastika* plan in order to prevent inward collapse, consisted of four granitic slabs with upright orthostats on four sides. A massive cap-stone was placed on the top with a port-hole in the eastern orthostat (i.e., in U-shape). The floor of the cist was also formed of a slab.

The earth filled in the pit was found to be loose and soft. There were found a number of pots of black ware, black-and-red ware which were conoids and round. A few pieces of bone were also recovered from the middle of the pit. The bottom of the pit was found paved with stone slab over

which were placed the funerary items including the typical Megalithic pottery, such as, Black-and-red Ware, black ware and red ware pots. The sherds of black-and-red ware consisted of mostly the bowls, dishes, etc., with a thin and fine fabric. Besides, iron objects in the form of a flat axe, spear, etc., a terracotta ear-ornament and four teeth have also been recovered. These burials might roughly be assigned to 50 BC.

21. EXPLORATION IN HANGAL TALUK, DISTRICT DHARWAD.— C.S. Seshadri of the Bangalore Circle of the Survey, discovered the following archaeological sites in the course of village-to-village survey.

Village	*Nature of remains*
Balihalli (14 41' 45";75 04' 05")	Ruined Saiva temple, inscriptions, inscribed hero-stones, sari-stones and loose sculptures of Sarasvati, Shanmukha, Virabhadra and *Sapta-matrika* panel assignable to *circa* twelfth-thirteenth century -
Byatnal (14 49' 00"; 75 13' 20")	Hero-stone of *circa* eleventh century
Chik Kavashi (14 39' 20"; 75 07' 15")	*Gosasa* inscription *of circa* ninth century; inscription of *circa* eleventh century and hero-stones
Devikop (14 50" 15"; 75 12'35")	Temple of Mahishamardini, inscriptions of *circa* eighth century, loose sculptures of Mahishamardini,Vishnu, *nandi,* Ga/a-Lakshmi panel and inscribed hero-stones of late Chalukyan period
Gadiyenkanahalli (14 42' 30"; 75 06' 40")	Somesvara temple (AD 1121); inscriptions and inscribed stones *(circa* twelfth century)
Gejjihalli (14 44' 10"; 75 06' 40")	Ruined Tailesvara temple *{circa* AD 1180); inscriptions, hero-stones, loose sculptures of Mahishamardini, Surya, inscribed image of *nandi* and architectural members *(circa* eleventh-twelfth century)
Gondi (14 37' 15"; 75 08' 50")	Somesvara temple of post-Vijayanagara period
Hallibail (14 10' 25"; 75 05" 35")	Inscribed hero-stones of *circa* eleventh century
Hanumankop (14 42' 30"; 75 05' 35")	Brick structures of post-Kadamba period; ruined temple and loose sculptures of Mahishamardini, Vishnu and inscribed hero-stones of *circa* twelfth century

Village	*Nature of remains*
Hirekavashi (14 37' 10"; 75 18' 05")	Inscribed hero-stones of *circa* eleventh-twelfth century and a large Gaja-Lakshmi panel
Hirur (14 44' 15"; 75 06' 15")	Ruined Siva temple, loose sculptures of Sarasvati, Ganesa, Mahishamardini, Surya, a large inscribed image of *nandi, Sapta-matrika,* Bhairava, inscriptions and hero-stones assignable to twelfth-thirteenth century
Honkan (14 35' 00"; 75 12' 15")	Siva temple of post-Vij ayanagara period
Hulgaddi (14 35' 00"; 75 12' 50")	Inscribed *sat*i-stones of twelfth-thirteenth century
Kadlikop (14 35' 45"; 75 14' 25")	Hero-stones of twelfth century
Kamanhalli (14 44' 45"; 75 05' 25")	Sculpture of Lajjagauri of *circa* seventeenth-eighteenth century; sculpture of *Sapta-matrika,* mound with ruined temple and architectural members
Karalkop (14 41' 50"; 75 02' 45")	Inscriptions of *circa* fourteenth century
Kelavarakop (14 45' 35"; 75 25' 15")	Siva temple of twelfth century; loose sculptures of Surya, Uma-Mahesvara, Virabhadra and inscribed hero-stones of *circa* eleventh-twelfth century
Kerekyatanhalli (14 39' 50"; 75 13' 55")	*Gosasa* inscription of *circa* ninth century; inscribed and uninscribed hero-and safi-stones of eleventh-twelfth century
Kiravadi (14 34' 15"; 75 13' 12")	*Gosasa* inscription of ninth-tenth century and *Sapta-matrika* panel
Lakshmipur (14 43' 15"; 75 01'20")	Inscriptions and inscribed hero-stones of *circa* tenth century
Malapura (14 45'23"; 75 14'30")	Inscribed sari-stone and a Gaja-Lakshmi panel
Mantagi (14 44' 15"; 75 03'35")	Loose sculptures of Ganesa, inscribed hero-stones and *nishidi* of thirteenth century
Nirlgi (14 40' 10"; 75 02'30")	Inscribed hero-stone of *circa* eleventh-twelfth century

Village	*Nature of remains*
Sagaravalli (14 42' 30"; 75 02' 30")	Saf/-stones
Samasgi (14 42' 10"; 75 02' 30")	Sculpture of Mahishamardini, Gaja-Lakshmi, Vishnu, Surya and *Sapta-matrika* panel, inscribed hero-stone and .raft-stone of *circa* twelfth century
Savikeri (14 42' 30"; 75 04' 40")	Inscribed hero-stones, *gosasa* inscriptions of fourteenth-fifteenth century; ruined Saiva temples and a mound yielding burnt-bricks (32 x 20 x 9 cm); sculptures of Mahishamardini, Vishnu and inscribed hero-stones of *circa* twelfth century
Sheshgiri (14 45'50"; 75 35'15")	Temple of Ramalingesvara of twelfth century, inscriptions and loose sculptures of Mahishamardini, *nandi* and *Sapta-matrika*
Shirgod (14 40' 20"; 75 06' 55")	Ruined Siva temple, mound yielding burnt-bricks (30x20x9 cm), loose sculptures of Mahishamardini, Vishnu and inscribed hero-stones of *circa* twelfth century
Sringeri (14 44' 15"; 75 04'11")	Architectural members and pillars of tenth-twelfth century built into a reservoir and hero-stones
Tilvalli (14 45' 25"; 75 15' 35")	Santesvara temple of Yadavas of Devagiri; inscriptions of eleventh-twelfth century; loose sculptures of Mahishamardini, *Sapta-matrika,* Virabhadra and *nandi*
Yettinahalli (14 42' 15"; 75 11'20")	Ruined Siva temple, Gaja-Lakshmi panel, inscriptions and hero-stones of *circa* eleventh-twelfth century

22. EXCAVATION AT KANAGANAHALLI, DISTRICT GULBARGA.— In continuation of the excavation carried out earlier *(1993-94,* pp. 63-64), wherein a brick stupa was laid bare, K.P. Poonacha of the Bangalore Circle of the Survey, assisted by M.V. Visweswara, W.V.S. Narasimham, T.P.B.K. Unnithan, Anand Tirtha, M.V. Mallikarjuna and S.L.B. Desai, conducted trial-excavation at two localities of Ranamandala in Sannati village and at the outskirts of Kanaganahalli village. While the excavation at Ranamandala 'ancient fortification' revealed three periods ranging from Mesolithic to late Satavahana phase, the digging at Kanaganahalli uncovered part of a stupa built in limestone and veneered with decorated members.

The excavation was carried out on the southern slopes of a circular mound, which stands to a height of nearly 3m from the present ground level. The mound (40 x 40 m) situated to the south-

west of the present village of Kanaganahalli had on plan, the limestone-built extant stupa with circular configuration of the drum portion. As many as four trial-trenches of 10 m square were laid in north-south axis and an area of 130.20 sq m was excavated to study the structural pattern of the stupa and the core pattern of the drum. The trial-trenches (XA1 and XA2) revealed a fair picture of the sectional elevation of the stupa in the area of operation. The stupa measures about 19 m in diameter. The railing with uprights and cross-bars to the south of the mound were exposed partly (pl.XII A). As many as eight uprights have been found in various stages of fall and destruction. All these were treated with circular and semicircular lotus medallions in the exterior whereas the interior of these were austere (pl.XII B). The cross-bars in the centre were carved with projected lotus medallion, matching with those on the uprights. Some of these cross-bars were found *in situ* facing outwards, similar to the uprights. The extant drum portion of the stupa was made up of limestone slabs of various dimensions and was located 3.70 m away to the north of the railings but, were found damaged due to the collapse of the superstructure. The interspace between the drum and railings was paved with dressed limestone slabs, which acted as the floor of the *pradakshinapatha.* Abutting the floor rose the lower portion of the drum (lower drum), decorated with panels (1.20x 1.10x0.15 m) depicting various episodes connected with Buddha's life, such as his birth, enlightenment, represented by worship of the seat with *Buddhapada,* monastic complex, etc., (pi.XIII). A few slabs did not even contain any ornamentation in the central portion except highly decorated pilasters with dwarf fluted shafts, half and full blown lotus medallions over which was carved an inverted bell-shaped capital carrying abacus, couchant elephants and lions, seated back-to-back.

The section between the veneering, decorated members and the inner wall of dressed-blocks was provided with two rows of bricks, set in lime following the contour of the drum. In fact, the gap between the panels was bound to the brick encasing with thick lime-mortar of 10 to 15 cm.

After an offset of 1.55 m rose the second stage of the drum (upper drum). The first stage was provided with cornice and fluted top containing numerous Brahmi inscriptions — the outer face of which was decorated with railing motif showing uprights and cross-bars in low relief. The lotus medallions, lion, and *triratna* were some of the motifs used for decorating the cornice. Coping of the miniature railing was decorated with twisted rope or *hara* with lotus medallions. The extant drum rising in two levels, measuring 2 m in height, was built of rectangular limestone-blocks with fine joints of dry masonry. The portions of *anda* jutted out from the upper drum were inclined to form a hemispherical dome. The upper drum contained decorated panels 1,3 x 1.16 x 0.16 m) with bas-reliefs depicting various Buddhist themes in three inscribed registers.

The sections revealed the nature of fall of members used for encasing the dome. A portion of the circular *chhatra* was found embedded near one of the uprights to the southern section.

A fragmentary NBP sherd was retrieved from the foundation pit of one of the uprights of the railing besides a few red ware pottery. Important antiquities included lead/potin coins of the Satavahana times, a set of metal bangles, a mutilated relief sculpture of Buddha in limestone, fragmentary terracotta figurine of Buddha seated in *padmasana* and architectural members in addition to a number of inscribed and sculptured slabs.

The epigraphical records noticed so far in the panels retrieved from the excavation could be dated from first century BC to first century AD. These inscriptions, divided into different categories, refer to the donations made by trade guilds, explanatory labels throwing light on the subjects depicted besides the names of Buddha, his close associate Ananda, son Rahula, etc.

23. EXCAVATION AT SANNATI, DISTRICT GULBARGA.— K.P. Poonacha, assisted by M.V. Visweswara, W.V.S. Narasimham, T.P.B.K. Unnithan, Anand Tirtha, M.V. Mallikarjuna and S.L.B. Desai of the Bangalore Circle of the Survey, conducted trial-excavation at a vast fortified mound known as Ranamandala on the left bank of the river Bhima at Sannati in Chitapur taluk.

A trial-trench of 5 m square, laid at the peak of the mound, excavated down to a depth of 7 m (pi.XIV A), exposed eleven layers with three cultural periods.

Period I was represented by non-geometric Mesolithic phase, wherein microliths on quartz material, comprising bladelets, points, lunates, borer-cum-burin, etc., have been found without any other cultural vestiges. The context of this needs to be further analysed in the light of Palaeolithic tools of Lower and Middle Palaeolithic culture found from the surface.

There was a break (9A) between Periods I and II, marked by a 20 cm thick compact brown soil.

Period II, characterized by a compact blackish brown soil (layers 9 and 8) was rich in pottery *viz.,* black-and-red ware, Black-slipped Ware and red ware. These were all made on fast to slow wheel of ill-levigated clay with impurities of sand grains. The surface in all the types of wares especially of black-and-red ware and Black-slipped Ware showed the tendency of crackled surface. In addition to the above, a fair amount of iron objects in the form of hooks and nails along with iron slags have also been retrieved. The period could be identified as non-Megalithic black-and-red ware.

In Period III A, identified as pre-Satavahana phase (layers 8a, 7 and 6), there was occurrence of a brick-built well (pl.XIV B) along with a large quantity of pottery, mainly comprising black-and-red ware and red ware. In addition, a good number of beads of terracotta and semiprecious stones like carnelian, milky-quartz, banded-agate, bangles made on shell and bone were also found. Polished stone rubbers and various types of arrow-heads, made on bone, formed other antiquities.

Period III B (layers 5,4,3,2 and 1) was represented by a series of floor activities in three successive stages as seen in layer 5 and structural activities as observed in Strata 2 such as, compact hard blackish soil mixed with pebbles, pottery and brownish sand patches which also contained charcoal and ash; compact dark brown clay rammed with potsherds and compact ashy soil.

Polished red ware, black-and-red ware, red ware and Black-slipped Ware (all black wares) formed the pottery types, recovered from layers 5 and 4. In addition to these Russett-coated Painted Ware and Rouletted Ware occurred in Strata 3. Two structures (h 0.40m) were found in the respective southern and western sections in Strata 2. Brick-built Structure 1 (h 0.45 m) measured 0.46 x 0.21 x 0.09 m. Structure 2 (h 0.62 m), also built of same bricks, contained seven courses. All the pottery reported earlier, occurred in Strata 2. Besides, varieties of beads made on semiprecious stones and terracotta, tracer beads made on shell and bone and the beads of lapis lazuli appeared in this period.

The lead and potin coins of Satavahana period were also found in relation to the polished red ware, Rouletted Ware and stamped pottery in red ware. Terracotta figurines found from these strata were **all** badly damaged.

Excavation revealed that the fortified Ranamandala on the left bank of the river Bhima at Sannati, was in continuous occupation right from the prehistoric times to the early historic times. A systematic large-scale probe in the area would definitely provide a chronological index to pre-Satavahana and Satavahana occupation in the northern Karnataka in particular and Karnataka in general.

24. EXCAVATION AT BANAVASI, DISTRICT UTTARA KANNADA — A trial-trench (5 m square) was laid by K.P. Poonacha, assisted by T.M. Keshava and Megharaj M. Hadpad of the Bangalore Circle of the Survey, inside the fortification (115 m), north-west of Sri Madhukeshvara temple in the backyard of a local resident. The excavation carried out to a depth of 6 m stratigraphically resolved into nine layers and four major periods *viz.,* Period I: Chutu, represented by layers 9 and 8; Period **II**: Satavahana, marked by layers 7, 6 and 5; Period **III**: Kadamba, indicated by upper portions of layers 5 (overlap), 4 and 3; and Period IV : post-Kadamba, represented by layers 2 and 1.

Period I was represented by the cultural assemblage of the Chutu rulers of Banavasi as attested by the lead/potin coins (pl.XV A) of Shivalananda and Mudananda. The lowest level yielded a solitary rectangular punch-marked silver coin taking back the antiquity of this strata to pre-Christian times. From the upper levels of layer (8) a few copper coins of Satavahana affinity were collected indicating thereby an overlapping of Periods I and II. Further, the ceramic pattern was represented by a distinct chocolate brown ware, red-slipped ware, Red Polished Ware and black-and-red ware. Also noteworthy were the beads of terracotta and semiprecious stones like amethyst, carnelian and crystal in various stages of manufacture. A rectangular large bead of lapiz lazuli (pl.XV B) however, formed one of the important finds. This speaks of a well developed lapidary industry in the early Christian era at Banavasi. Among other antiquities mention may be made of a fragmentary carved comb of ivory (pl.XV C) and a mutilated terracotta figurine.

Period **II** ascribable to Satavahana period, dominated the cultural vestiges wherein a huge enclosure-wall (5.75 m x 2.50 m x 36 cm) was encountered. This wall (pl.XVI A) was made of bricks (41 x 18 x 8 cm) of well-levigated clay, with its foundation laid into the layers of Chutu period. The ceramic assemblage comprised polished red ware, Russet-coated Painted Ware, red-slipped ware, chocolate brown ware, Rouletted Ware, Micaceous Red Ware and imitated Arretine Ware. A brisk activity of copper smelting was evidenced from the floor level in Strata 7 in the form of encrusted coins in profusion. Perhaps this could be the mint (?) of Satavahana period. Antiquities such as, terracotta fragments, lead coin of Pulamavi, terracotta bullae with the impression of Roman Emperors, dice or pin of ivory (pl.XVI B) and objects of copper and iron, micro-beads of semiprecious stones, glass, paste, lac and coral (pl.XVI C), in additon to glass bangles, were found in profusion.

Period **III** (Kadamba phase) was represented by red-slipped ware, polished red ware and grey ware along with a sprinkle of Micaceous Red Ware. Beads of terracotta, semiprecious stones and glass, fragmentary terracotta figurines, iron nails of different sizes comprised other finds.

Period IV, represented by upper parts of Strata 3, 2 and 1, was post-Kadamba with much disturbed layers. Besides a fragmentary sculpture of Kali in schist stone, some sherds of dull red ware, grey ware, brick-bats, a few glass beads and bangle pieces were collected from this level.

25. EXCAVATION AT GUDNAPURA, DISTRICT UTTARA KANNADA.— In continuation of the previous year's work *{1993-94,* pp. 67-68), the Bangalore Circle of the Survey under K.P. Poonacha, assisted by T.M. Keshava and Meghraj M. Hadpad resumed excavation at Gudnapura, where a huge structural complex was exposed (pl.XVII), keeping the Virabhadra temple *{circa* twelfth century) as nucleus, built inadvertantly right over these structures, almost in the centre in north-south orientation. For a clock-wise description of the structures these were divided into three blocks *viz-,* A, B and C (fig-9).

In Block A, a brick-built rectangular temple (STR-I) in east-west orientation, overlooking the main entrance to the complex was exposed. This brick-built (43 x 32 x 8 cm) temple (21 x 10 m), identified with the *kama jinalaya* of Kadamba Ravivarma's (AD 485-519) inscriptions, contained a *garbhagriha* (3.4 x 3 m), preceded by a ten *piWaied-mandapa* (5.7 x 3.4 m), with a porch or *mukha-mandapa* (2x1.4 m) and a flight of steps at east. Both the sanctum and the *mandapa* with a *pradakshina,* were accessible from the north and south by means of laterally descending steps (i.e., the flight of steps at north descend towards west while the steps on the southern side, towards east to *rajavasagriha,* STR - IX of block C. The sanctum had *apranala* outlet towards north. A platform was built all along the western wall of the *garbhagriha,* with post-holes, which might have accommodated wooden pillars. The entire temple, enclosed by a *prakara* which opened at the east into a rectangular *dvara-mandapa* with rooms at north and south. The entire courtyard of the temple within the enclosure was carefully paved with bricks arranged in a systematic pattern. The rectangular *dvara-mandapa* had a large pillared-verandah (2.6 x 12.70 m) in north-south orientation with two rectangular rooms (2.5 x 2.2 m) abutting the *prakara* at north and south respectively. A flight of steps at east and west respectively, opened into the large courtyard, referred to as STR V and into the inner closed courtyard of the Manmatha temple. Interestingly, a flight of s,teps each was provided from west to the northern and southern chambers.

There were three major structures (STR II, III and IV) in Block-B. STR II, identified as the platform (6.2 x 3.8 m) for royalty to watch the *utsava* or dance festival in the dance halls was built to the north of this platform. This platform built in laterite bricks contained a flight of brick-built steps at east and south (disturbed). On the southern side of this royal platform was a brick-built semicircular *chandrasila* at north serving as the northern entrance to STR I, i.e, Manmatha temple. STR III, was represented by more or less a squarish *nartana-mandapa* (5.9 x 6.4 m), disturbed in its northeastern and western sides. Almost in the centre was a disturbed square podium having a pedestal with a socket towards north to accommodate movable sculpture of a deity perhaps Manmatha, in whose presence was held *vasantotsava* (the festival of dance). Abutting the northern wall of this *nartana-mandapa* were small brick-built platforms. The western, northeastern and northwestern parts of the enclosure-wall of this *nartana-mandapa* were found disturbed. The eastern enclosure-wall of this structure had an imposing entrance corresponding to the eastern entrance of the *nartana-mandapa.* Further towards east of STR III was STR IV within a disturbed enclosure, identified as the second

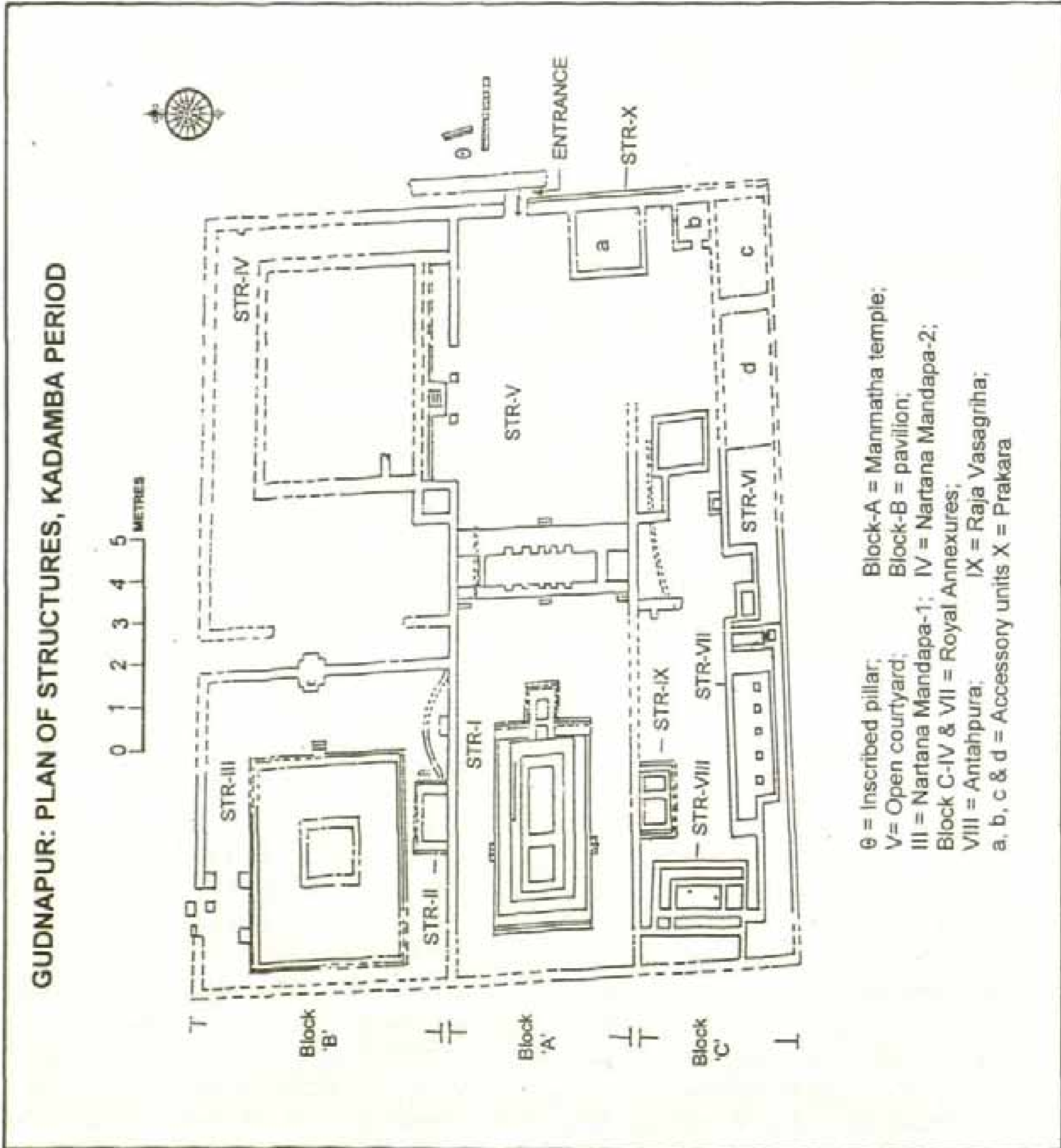

GUDNAPUR: PLAN OF STRUCTURES, KADAMBA PERIOD
0 1 2 3 4 5 METRES
ENTRANCE
STR-X
STR-IV
STR-III
STR-V
STR-II
STR-I
STR-IX
STR-VIII
STR-VII
STR-VI
a
b
c
d
Block 'B'
Block 'A'
Block 'C'
θ = Inscribed pillar; Block-A = Manmatha temple;
V= Open courtyard; Block-B = pavilion;
III = Nartana Mandapa-1; IV = Nartana Mandapa-2;
Block C-IV & VII = Royal Annexures;
VIII = Antahpura; IX = Raja Vasagriha;
a, b, c & d = Accessory units X = Prakara

Fig. 9

nanana-mandapa. From the plan, location and in relation to the structural pattern, it could be surmised that STR III (i.e., *nartana-mandapa)* was meant for the use of royal personalities where the accessibility was from the Manmatha temple alone. The second *nartana-mandapa,* i.e, STR IV in north-south orientation was also roughly squarish with a pillared-pavilion towards south and a screen-wall opening into STR V, i.e., open courtyard.

The Structures VI and VII in Block C, located to the southern side of Virabhadra temple, were the royal auxiliary structures, built both in laterite and brick with the same conventional mouldings as seen at the Manmatha temple. The Structure VIII formed the *antahpura* and was located in the southwestern corner of the Virabhadra temple. It was found disturbed due to its location on the edge of the mound. However, on plan, the structure appeared to have a large hall (2.00 x 5.00 m), flanked by small rooms at north (2.00 x 1.00 m) and south (2.00 x 1.80 m) with verandahs or closed balcony at east and west (0.9 x 10.00 m and 0.9 x 7.3 m). Interestingly, the structure was built very close to the southern *prakara-wall* of the Manmatha temple. The Structure IX identified as *rajavasagriha,* built abutting the southern *prakara-wall* was located slightly to the north-east of *antahpura.* Some more disturbed rectangular structures, identified as accessory units (mentioned as a, b, c and d in the drawing) to the south-east of Virabhadra temple might have served as servant's quarters.

Excepting a prominent grey and red-slipped ware, fragmentary soapstone sculptures and terracotta beads of tubular shape, no other objects could be traced.

26. EXPLORATION IN DISTRICT UTTARA KANNADA.— K.G. Bhatsoori of the Directorate of Archaeology and Museums, Government of Karnataka, Mysore, reported the discovery of the following sites in Ankola taluk, in the course of village-to-village survey.

Village	*Nature of remains*
Ankola	Durga (eighteenth century)
Aversa .	Mahishamardini (fourteenth century)
Belambra	Devi, locally called Allakki Devaru (seventeenth century)
Bhavikeri	*Isvara-linga* (seventeenth century)
Boralli .	*Nandi* (sixteenth century)
Brahmoor	*Siva-linga* locally called Madhulingesvara (eleventh century)
Hichkhad	Two hero-stones (seventeenth century)
Hillur	Siva-limga, Ramalingesvara temple, Ganapati image (seventeenth century)
Manjaguni	Ganapati temple and sculpture (seventeenth century)

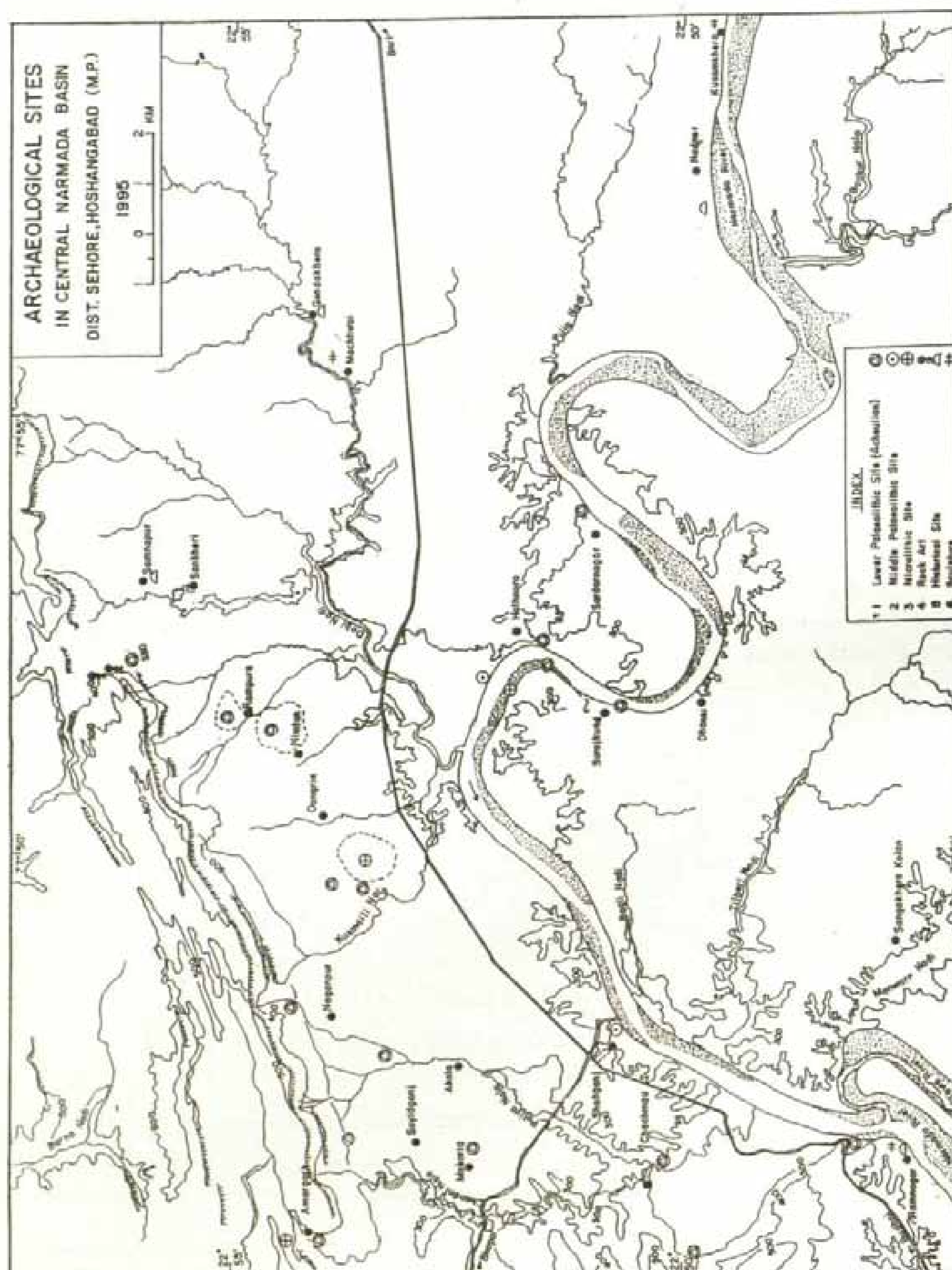

ARCHAEOLOGICAL SITES
IN CENTRAL NARMADA BASIN
DIST. SEHORE, HOSHANGABAD (M.P.)
1995

Fig. 10

Village	*Nature of remains*
Moralli	Ganapati sculpture (eighteenth century)
Pooj ageri	Mahishamardini (eighteenth century)
Shatgeri	Two hero-stones (sixteenth century)
Shedgeri	Sculpture of Anjaneya (seventeenth century)
Shivapura	Two *nandi* sculptures (seventeenth century)
Surve	Two hero-stones (seventeenth century)

MADHYA PRADESH

27. EXPLORATION IN DISTRICTS HOSHANGABAD AND SEHORE.— Nizamuddin Taher of the Prehishtory Branch, Nagpur, of the Survey, jointly with P.K. Raha, A. Sonakia, S. Biswas and Y. Sitaramaiah of the Palaeontological Division of the Geological Survey of India, Nagpur, carried out exploration with a view to reconstructing the Quaternary history of the alluvial strip along the Vindhyan range. The survey was carried out in the region between 22° 45'N; and 23°00'N; 77°45'E and 78°OO' E, confined mainly to the northern bank of river Narmada (fig. 10) surrounding the hominid fossil site at Hathnora.

The Lower Palaeolithic sites usually occur in different landscapes such as outcrops, alluvial plains, river and *nallah* beds. The artefacts were mainly scattered on the surface except at Hathnora (pl.XVIIIB, 1-4) and Surajkund (pl.XVIIIA) where they occurred in the context of highly calcarious pebbly conglomerate alongside mammalian fossils. The industry mostly comprised handaxe, cleavers, scrapers, discoids, etc., and were fabricated on quartzite. The morphological characters as noticed on the artefacts suggest that the industry belonged to the Late Acheulian cultural phase.

The Middle Palaeolithic artefacts were noticed in the context of river deposits. At Hathnora they were located in the river section whereas at Shahganj they were observed on the Narmada bed. The artefact assemblage comprised scrapers, points, flakes, etc., of crypto-crystalline material. Perhaps these occurred in a secondary context as the artefacts from both these sites were rolled.

Altogether four microlithic sites have been reported. Of these, the site at Dongria was very rich in artefacts. The assemblage including both finished and simple artefacts, were fabricated on crypto-crystalline material. Large amount of debitage suggested that artefacts were manufactured at the site.

Rock-paintings belonging to the historical period, have been noticed on the walls of sandstone caves at Sankheri. These depict mostly the hunting and battle scenes besides a few floral patterns in white and red colour. The caves lie at a height of about 40 m from the surrounding ground level.

The historical sites were also located on the alluvial plains. A few loose sculptures were noticed at Kusumkhera, Machhwai and Ramnagar, all belonging to the historical period. The exploration in the region brought to light the following sites.

District	*Tehsil*	*Village*	*Nature of remains*
Hoshangabad	Babai	Surajkund	Lower Palaeolithic (pi.XVIII A,l~ 3); microlithic
Sehore	Budhni	Akola	Lower Palaeolithic
-do-	-do-	Amargarh	Lower Palaeolithic
-do-	-do-	Chachmou	Lower Palaeolithic
-do-	-do-	Dongria	Lower Palaeolithic; microlithic
-do-	-do-	Gondhakhera	Historical mound
-do-	-do-	Hathnora	Lower and Middle Palaeolithic
-do-	-do-	Kusumkhera	Loose sculptures of historical period
-do-	-do-	Makoria	Lower Palaeolithic
-do-	-do-	Machhwai	Loose sculptures including hero-stones of historical period
-do-	-do-	Nadner	Historical mound
-do-	-do-	Nangpur	Lower Palaeolithic
-do-	-do-	Nimton	Lower Palaeolithic (pi.XVIII B,5)
-do-	-do-	Rampura	Lower Palaeolithic
-do-	-do-	Ramnagar	Lower Palaeolithic; microlithic; loose sculptures and historical mound
-do-	-do-	Sardarnagar	Lower Palaeolithic (pl.XVIII A, 4)
-do-	-do-	Samnapur	Historical mound
-dp-	-do-	Sankheri	Lower Palaeolithic; rock-paintings of historical period
-do-	-do-	Sayidganj	Lower Palaeolithic
-do-	-do-	Shahganj	Middle Palaeolithic; microlithic

28. EXCAVATION AT PIPRI, DISTRICT WEST NIMAR.— The Prehistory Branch, Nagpur, of the Survey, under the direction of S.B. Ota, assisted by N.K. Nimje, R.K. Dwivedi, K.M. Girhe, K.M.

Saxena, Ghayasuddin, C.L. Yadav, P.C. Dogra, P.S. Pashine, Prabhas Sahu, P.K. Dikshit and Ashok Gedekar carried out excavation at Pipri, in Barwani tehsil, with a view to ascertaining the nature of Chalcolithic cultural assemblage in the region and in a small site (hamlet site) in particular. The excavation here was taken up as part of salvage archaeological investigation in the submergence area of Sardar Sarovar Dam, on the river Narmada in continuation of the work carried out in previous year *(1993-94,* pp. 72-73).

This Chalcolithic settlement (22° 4' 2" N; 74° 59' 25" E), about 14 km from the tehsil headquarter at Barwani could be approached by a *kachcha* road from Borlay via Pipri. Located about 300 m away from the left bank of Sosar *nallah,* a tributary of Narmada, it is about 1.25 km north of the present day village at Pipri. The river Narmada flows at a distance of about 1.5 km north of the site.

The site, locally known as Gualberi, amidst the badland topography of Narmada older alluvium was almost circular in shape, covering an area of about 300 sq m. The surface level of the site was 142 m from M.S.L. which rose to about 5 m from the surrounding ground level. As the site was very small, a trench (10 x 10 m) was taken up in the middle of the settlement. The cultural deposit on the surface was very thin (6 cm), which rested on the black sediment (40 cm thick), overlying the older alluvium. In fact, the major cultural debris were recovered from the pits rather than the regular deposits.

The excavation revealed dwelling pits, roughly circular on plan and wide at the bottom, cutting into the yellowish *kankary* silt. The average diameter of these dwelling pits at the floor was about 1.65 m; whereas the average depth was about 1.50 m. The floor of these dwelling pits was either plastered with lime or yellowish silt. The most elaborate dwelling pit encountered during the excavation contained two descending steps (pl.XIXA). The floor of this dwelling pit was painted with a thick band of lime running around the border of the floor, probably to decorate the floor. This specific dwelling pit probably belonged to the chief of the community. Besides the evidence of dwelling pits, sunken-floors (pl.XIXB) were also unearthed with an average diameter of about 1.8 m.

Excavation also yielded the evidence of large-sized hearths in circular pits cut into the yellowish *kankary* silt. The hearths were prepared inside the pit probably to avoid outside wind, so that fire in the hearth could continue for a longer time. The size of the hearths suggest that these might have served as community hearths (pl.XXA). These hearths were associated with a large amount of faunal remains and potsherds.

Besides dwelling structures and community hearths, an animal burial (pl.XXB) and a symbolic human burial were also exposed. The animal burial-pit (2.20 m and 0.72 m) was cut straight into the yellowish *kankary* silt down to a depth of about 2.0 m. After arranging rubbles in a circular fashion on the pit floor, the secondary bone remains in articulated condition of a *Bos sp.* was placed on it, covered with sediment. Subsequently, towards west of the pit another rodent of *Lepus sp.* was buried, which was once again covered with thin deposit of earth. Finally, the rubbles were arranged in a circular fashion. This burial-pit was filled only with habitational debris.

The symbolic human burial, found in a circular pit (1.16 m) was cut straight into the yellowish *kankary* sediment down to a depth of 2.30 m. The burial goods comprised two painted red ware jars placed in mouth-to-mouth position inside a huge red ware jar, covered by a black ware jar in upside-down position. Other burial-pots included two painted red ware jars, a red-slipped jar and a painted red ware bowl.

The ceramic assemblage mainly comprised black-on-red ware with a variety of designs including human, fish, bird (pl.XXIA), lizard and geometric patterns. Among other ceramic types, mention may be made of white painted black-and-red, plain black-and-red, red-slipped, plain red ware, etc. The shapes included mostly the jars and bowls with a round base. The pottery was mostly hand-made or prepared on slow wheel, out of levigated clay and well-fired.

The lithic industry formed the second largest collection comprising both microliths and heavy-duty stone artefacts. Microliths (pls.XXIB and XXIIA) comprised both finished and simple artefacts which were mostly fabricated on chalcedony. The finished variety included both geometric and non-geometric types. Large amount of debitages recovered from the excavation suggest that the tools were manufactured at the site. The heavy-duty stone artefacts (pl.XXIIB), fabricated on quartzite, comprised varieties of scrapers, steep-edged scraper, simple artefacts, etc. Clusters of stone artefacts mostly of debitages were noticed on the northern side of the mound. These clusters of debitages suggest that stone artefacts were manufactured at these spots away from the main settlement area as the available surface area for occupation on the mound was limited.

The other antiquities recovered from the site included a copper fish-hook, a bangle prepared out of copper wire, beads of carnelian, steatite, paste, etc., shell pendant and scraper, bone spatula, hopscotches on potsherds, clay sling-ball, fragment of a ring-stone, saddle-quern and stone mullers.

29 .EXCAVATION AT UTAWAD, DISTRICT WEST NIMAR.— The Prehistory Branch, Nagpur, of the Survey, under the direction of S.B.Ota, assisted by K.M. Saxena, R.K. Dwivedi, K.M. Girhe. N.K. Nimje, Ghayasuddin, C.L.Yadav, P.S. Pashine, PC. Dogra, Prabash Sahu, P.K. Dikshit, J.S. Dubey and Ashok Gedekar carried out excavation at village Utawad, Barwani tehsil, with a view to ascertaining the nature of Chalcolithic assemblage in the area. This excavation was carried out in continuation of earlier work *(1993-94,* pp.72-73), as part of the salvage archaeological investigation in the area to be submerged under the Sardar Sarovar Dam Project on Narmada.

This site (22° 4^1 25^1 N; 75° 0' 7" E) is located about 800 m north of the present village settlement at Utawad, 400 m away from the right bank of Sosar *nallah,* a tributary of the river Narmada. It is about 14 km from the tehsil headquarter at Barwani and approached by a *kachcha* road from Borlay via Pipri. The river Narmada flows at a distance of about one km, north of the site.

The crescent-shaped mound, in the middle of the erosional topography was formed of yellowish *kankary* silt. The surface of the mound rises upto a height of 144 m from M.S.L. and 6 m from the surrounding ground level. The site covers an area of about 1500 sq m with cultural debris (0.5 m thick), resting on black sediment (0.8 m thick).This black sediment overlies the older alluvium

viz., yellowish *kankary* silt. Exposed in the form of badland topography, it surrounds the site. The mound is partially disturbed at the surface due to cultivation. Two independent cuttings were taken up on both the eastern and the western ends of the crescent-shaped mound, cuttings 1 (pl.XXIIIA) and 2 respectively, with a view to understanding the intra-settlement pattern.

The excavation revealed the evidence of only Chalcolithic culture, divided into two phases—I and II on the basis of structural evidences and other associated materials.

The phase I was characterized mainly by the occurrence of dwelling pits (pl.XXIIIB), cut into the yellowish *kankary* silt. The average diameter and depth of these pits were 1.70 and 1.20 m respectively. The floor of these pits were either plastered with lime or clay. The structural remains of phase II included sunken-floor without fire-place, sunken-floor with fire-place (pl.XXIIIC) and a floor at the surface level (pl.XXIVA).

Two types of fire-places *viz.,* individual and community fire-places, were encountered. The former type could be encountered both on the floor of the house as well as outside in phase II. These hearths might have been used by an individual or a family; hence termed as individual fire-place. The latter variety occurring in phase I, was a large-sized hearth in a circular pit which probably served the purpose for a large group of individuals, hence termed as 'community fire-place'. Both the varieties of fire-places were associated with large amount of faunal remains.

Besides, a number of storage bins associated with phase II occurred in the form of circular pit in cutting 1 area. These were found plastered with both clay and lime. The storage-jars were kept within these pits filled with pure ash.

One of the important findings from the excavations was the animal butchering-cum-roasting spot (pl.XXIV B), encountered in cutting 2 area. Here a huge hearth prepared out of rubbles was exposed, found associated with large amount of both charred and uncharred bones. From this spot a number of quartzite artefacts were collected indicating their use for butchering of animals.

Another significant evidence *viz-,* the non-sepulchral symbolic pot-burial within the habitational area was traced in phase II. However, the unique feature which differentiated these burials from other symbolic pot-burials, commonly found in most of the Chalcolithic sites, was the *palas* leaf impressions on the base of the burial-pots (pl.XXIVC).

The ceramic industry of phase I comprised mainly white painted black-and-red, black-on-red and associated red ware which also continued in phase II. However, the frequency of painted sherds in phase I was more than the subsequent phase II. Further, certain painted designs on red ware, found in phase I, were typical of this phase and were uncommon in phase II. Similarly, the ceramic varieties of phase II, included mostly the chocolate-slipped red ware jars with splayed-out rounded rim and ring-base, which were completely absent in phase I.

The copper objects recovered from the excavation included a fish-hook, an antimony rod, a broken needle, a ring, and a bangle fragment, besides a large number of beads of steatite, paste,

carnelian, terracotta, etc. Among other antiquities, mention may be made of shell pendants and bangle pieces; terracotta hopscotches, skin-rubber, pendant, wheels, cakes, lamp etc., and stone saddle quern, pestles, balls and ring-stones.

The lithic industry comprised both microliths (pl.XXVA) and heavy-duty stone artefacts (pl.XXVB). Microliths were mostly fabricated on chalcedony. Large amount of debitages from the site suggest that it was manufactured at the site. The crested-guided ridge technique was used for manufacturing the blades. The finished artefacts comprised both geometric and non-geometric variety, including lunates, triangles, backed-blades, points, etc. The heavy-duty stone artefacts were made on quartzite which included utilized flakes, varieties of scrapers, choppers, flake cores, simple flakes, etc.

30. EXPLORATION IN DISTRICT WEST NIMAR.— The Prehistory Branch, Nagpur, of the Survey, under the direction of S.B.Ota, assisted by K.M. Saxena, N.K. Nimje, R.K. Dwivedi, Ghayasuddin, K.M. Girhe, C.L.Yadav, P.S. Pashine, carried out Geo-archaeological investigations confined to about half a kilometre stretch along the Sosar *nallah,* a tributary of the river Narmada. The study area, located about 14 km from the tehsil headquarter at Barwani, was situated between the Chalcolithic mound and the village at Utawad. The objective of this investigation was to understand the Quaternary formations and the associated cultural remains of the area. This work was undertaken as part of salvage archaeological investigation in the submergence area of Sardar Sarovar Dam Project.

The exploration which brought to light a long stretch of high-le vel gravel deposit, was mostly confined to the right bank of Sosar *nallah* (pl.XXVIA). This high-level gravel (2.0 m thick), maintaining a uniform surface level of 138 m from MSL, inspite of being the area in an erosional landscape, was divided into two units with a disconformity (pl.XXVIB). The bottom unit (25 to 30 cm thick), composed of basalt gravels which were highly weathered. This horizon was associated with Acheulian artefacts fabricated on basalt and dolerite (pl.XXVIC). This Acheulian gravel bed underlies a deposit of clayey silt with *kankars.* Overlying the Acheulian gravel horizon, was the top unit gravel deposit, associated with Middle Palaeolithic artefacts. The composition of this high-level gravel unit was mostly of crypto-crystalline and quartzite pebbles with pockets of coarse sand. The gravel size of the top unit was smaller than the gravels of bottom unit. Moreover, the gravels of top unit was comparatively less weathered than the bottom unit, because of type of material composition of the gravels. The Middle Palaeolithic artefacts, collected from this gravel horizon were mostly rolled, suggesting its secondary context of occurrence.

The Narmada older alluvium which was yellowish *kankary* silt, stratigraphically overlies the Middle Palaeolithic high-level gravel and underlies the black sediment. The older alluvium maintained a level of 143 m, whereas black sediment maintained 144.5 m from MSL in the area. The Chalcolithic settlement in the area was on the black sediment.

MAHARASHTRA

31. EXPLORATION IN DISTRICTS AMRAVATI AND WARDHA.— D.N. Sinha of the Aurangabad Circle of the Survey, during the course of village-to- village survey, noticed antiquarian remains at the following sites in Sangamner taluk.

Village/Site	*Nature of remains*
Chandanapuri	Late medieval Siva temple with *linga-pitha;* four old *wadas* of early nineteenth century; Savargaon Tal, two highly disturbed medieval sites yielding sherds of red ware and black ware representing jar, dish and bowl
Zole	Late medieval Siva temple with *linga-pitha* and loose sculptures of Ganesa and *nandi* in front of the temple; Ganesa temple of eighteenth century

32. EXPLORATION IN DISTRICTS AMRAVATI AND WARDHA.— The Excavation Branch I, Nagpur, of the Survey, under the guidance of AmarendraNath, assisted by N.C. Prakash, N.K.S. Sharma and M.L. Smith (University of Michigan) carried out a two-stage exploration programme in the vicinity of the early historical site of Kaundinyapura (21°53* N; 78°09' E). The aim of the research was to determine the settlement pattern for the early historic and subsequent periods within a 10 km radius of the site at Kaundinyapura, and to reconstruct a profile of site occupation through a series of systematic surface collection units at Kaundinyapura itself. The result of the exploration included a number of previously unrecorded sites.

On the eastern bank of the river Wardha in the vicinity of Vadhona (21°49' N; 78°11[1] E), a microlithic site marked by the presence of blades and bladelets, made on good quality translucent chert was noticed. Chert was found in abundance as a raw material, which was available as nodules of various sizes; the presence of a microlithic site at this locale may be explained by the attraction of a chert source of particularly good quality, as microliths were generally rare in the survey zone.

Several villages showed substantial mounds with cultural deposits ranging from the early historic to medieval periods *viz.,* Dhamantri (2P56[1] N ; 78"09' E), Ghota (2P53[1] N ; 78°O3' E), Vathoda (21°52' N ; 78°12' E). Mounds comprised solely the medieval materials, were examined at Anjansingi (21°50' N ; 78°08' E), Jalgaon (21°59' N ; 78°11" E), Nandpur (21-55[1] N ; 78-11[1] E), Nimboli (21°50[1] N ; 78°11' E) and Pipalkhuta (21°49' N ; 78° 11' E). The demonstrable increase in settlement density during the medieval period was probably not a simple product of population growth alone, but perhaps represented the ability of a more complex political system to establish and maintain settlements away from central towns. The use of large-scale architectural modification was also evident during this period at the sites of Marda (21°53* N ; 78°06' E) and Varkhed (21°58' N ; 78°08' E), the upper portion of the mounds showed successive layers of pise construction datable to the medieval period, based on the inclusion of pottery. This type of mud-construction, laid as

successive layers upto a total depth of six metres, was intended to buttress or level off a previously-existing mound in preparation for new construction. The principal attraction of a mound for settlement might have been for protection from flood rather than human (the recent heavy rains attest to the potential for flooding in the alluvial plain bordering the river Wardha). However, the need for defence could also be addressed by this type of construction. At Khubgaon (21°53' N ; 78°14' E), the remains of a pise fortification was indicated by two circular mud towers, approximately 18 metres high, at the outskirts of the modern village.

The pottery, such as grey coarse ware, coarse red ware with a variety of thin watery slip, and black medium-to-coarse ware with a highly burnished shiny exterior were associated with these medieval remains. Types included jars, bowls and lamps, as well as a variety of *handi.* Two special types *viz.,* ajar or bowl with an everted rim, coated with an orange micaceous wash and a narrow-necked jar with bright red, glossy burnished slip occurred in this period. Besides, quern made of locally available basalt and various types of hand-made glass bangles were also recovered.

A number of mounds located in modern villages are being actively quarried for ash-rich soils. As a result, several villages were encountered in which the only sign of ancient habitation was recovered from the modern house-walls *viz.,* Anjanvati (21°50' N ; 78°06' E), Borda (21°51' N ; 78°0V E), Chanusta (21°52' N ; 78°06' E), Partoda (21°58' N ; 78°09' E) and Takarkheda (21°57' N ; 78°09' E). It was often difficult to ascertain whether the materials in the house-walls were derived locally or brought from elsewhere; since not all villages contained evidence of this kind, however, it may be fairly safe to assume that modern house-walls reflect a local source of supply for mud-plaster. As some of the mounds are on the verge of total disappearance, the study of house-walls may be the only way to gather archaeological information.

33. EXPLORATION IN DISTRICT BULDHANA.— N.G. Nikoshey, assisted by Ghayasuddin and R.G. Katole of the Prehistory Branch, Nagpur, of the Survey, carried out exploration of the area to be submerged under Khadakpurna and Jigaon irrigation projects on the river Purna, with a view to ascertaining the archaeological potentiality of the area. The exploration has brought to light the following sites of archaeological interest:

Tehsil	*Village*	*Nature of remains*
Deulgaon Raja	Chinchkhed	Medieval temple remains with loose sculptures of Ganesa, *Siva-linga* and *nandi*
-do-	Garkhed	Medieval mound
-do-	Khallalgawhan	Medieval mound with stray sculptures of *nandi,* Siva-Parvati, Durga, Hanuman and *Siva-linga*
-do-	Mandapgaon	Remains of medieval temple dedicated to Siva with stray sculptures of *Siva-lingas,* Ganesa and *nandi*

Tehsil	*Village*	*Nature of remains*
Deulgaon Raja	Sultanpur	Remains of medieval temple and *dvipa-stambha* of brick; remains of medieval *garhi*
Jalgaon	Dadulgaon	Medieval mound
-do-	Garkher	Medieval mound
-do-	Hingna	Historical mound; Black-slipped Ware, red ware, black- and- red ware; shell and terracotta beads, stone pestles
-do-	Jaregaon	Medieval mound
-do-	Manegaon	*Garhi* mound of medieval period
Nandura	Alampur	Medieval mound locally known as Modh
-do-	Mamulwari	Medieval mound
-do-	Yerti	Late medieval temple of Maratha style dedicated to Siva
Shegaon	Bhastan	Historical mound; Black-slipped Ware, red ware, black-and-red ware; shell and terracotta beads, stone pestles and remains of brick (49x23x9cm) structures
-do-	Bhongaon	Medieval temple remains with *Siva-linga, nandi* and a sculpture of Vitthal-Rukmini
-do-	Bhot	Stray sculptures of Hanuman, *nandi,* Siva-*linga* and Ganesa of medieval period
-do-	Dadgaon	Late medieval temples dedicated to Siva, Hanuman and four *chhatris*
-do-	Hingna Isapur	Late medieval temple
-do-	Kathora	*Garhi* mound of medieval period
-do-	Mansgaon	Medieval mound locally known as Dongarkhed
-do-	Pahur	Stray sculptures of Hanuman, *nandi* and Siva-linga belonging to late medieval period
-do-	Roti	Medieval mound
-do-	Sogwada	Medieval mound

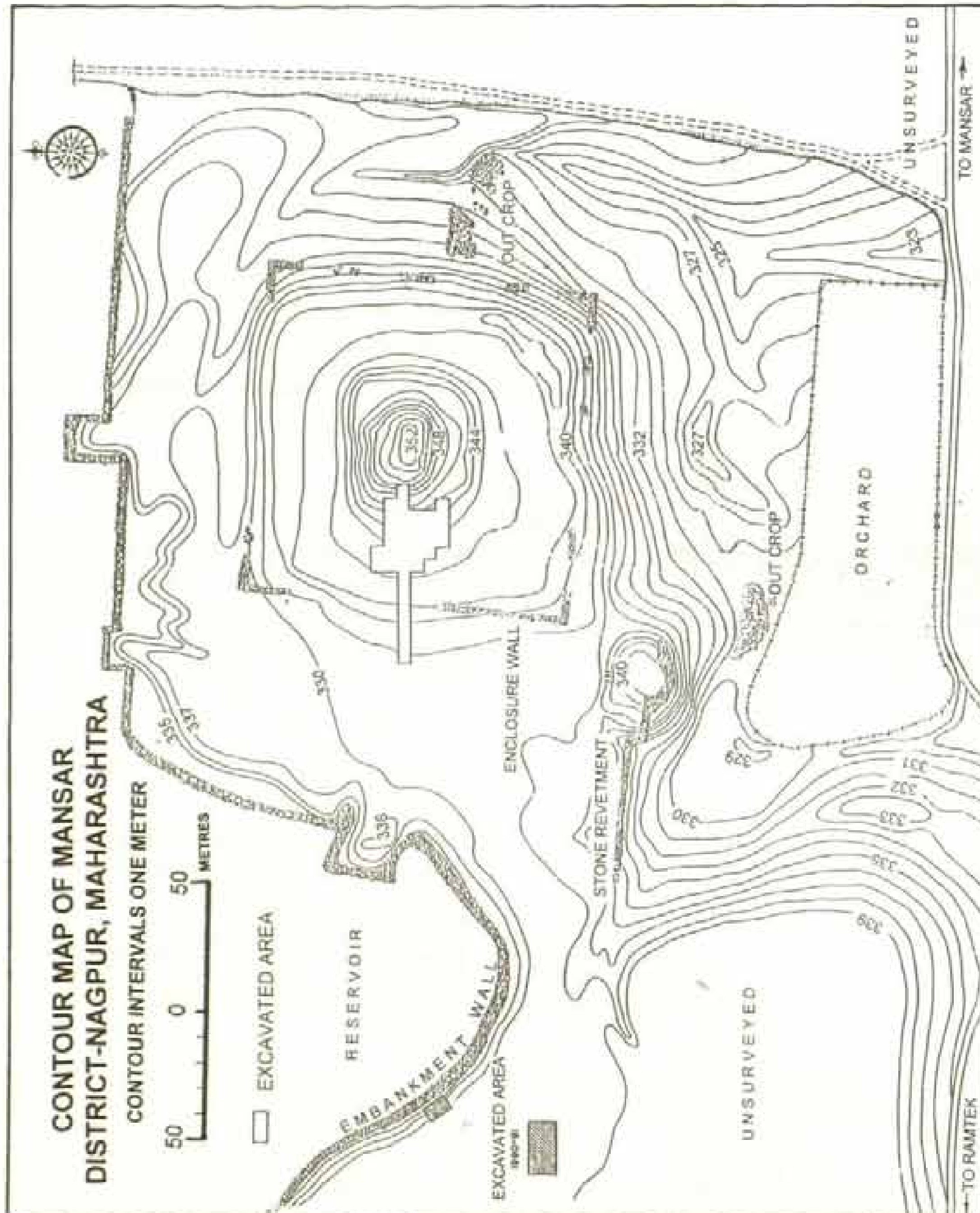

CONTOUR MAP OF MANSAR
DISTRICT-NAGPUR, MAHARASHTRA
CONTOUR INTERVALS ONE METER
50 0 50
METRES
EXCAVATED AREA
RESERVOIR
EMBANKMENT WALL
EXCAVATED AREA
ENCLOSURE WALL
STONE REVETMENT
OUT CROP
OUT CROP
ORCHARD
UNSURVEYED
UNSURVEYED
TO MANSAR
TO RAMTEK

FIG. 11

34. EXPLORATION IN DISTRICTS CHANDRAPUR AND NAGPUR.— Explorations and excavations were conducted in Districts Nagpur and Chandrapur in continuation of a major project initiated in 1991-92. This project was started at the request of Vikas Amte who had found a large number of Stone Age tools and fossils in and around the area at Anandwan, Warora.

In the current field season the team comprised G.L. Badam, Usha Gadre, Jitu Mishra and Nripen Das of the Deccan College Post-graduate and Research Institute, Pune, to expose the antiquities systematically and to establish their stratigraphic sequence, two trenches of 1 m x 1 m x 1 m and one trench of2mx2mxlm were taken up. Two trenches were dug up at 50 acres Reeth, about half a km north of the camp at Anandwan which revealed bones, beads, Stone Age tools and pottery. The third trench was excavated at Kauthachiwadi, just a little away on the southern side of the camp behind the water tank. In addition to these trenches, several Middle and Upper Palaeolithic artefacts and fossils were collected as a result of explorations from nearby areas. The tools were generally made on chert and chalcedony. The source of chert was traced to a hillock located at Dhongergaon, about 10 km north-west of Anandwan. Around the same place some more prehistoric sites yielding Middle Palaeolithic to microlithic artefacts and fossils were discovered at Dahala and Tadala. At Pimpalgaon the explorations brought to light sites ranging from the Middle Palaeolithic to the historical period.

The discovery of Lower and Middle Palaeolithic sites at Papa-Mia-Tekri, besides some traces of mammalian and reptilian fossils at Pisdura with cultural material ranging from the Middle Palaeolithic to the Mesolithic periods have also been reported. Fossils were also collected from Ramdigi and Bhatala. These include *Bos bubalus, Equus,* cervids, antelopes, turtles and crocodiles.

Further, during the course of survey of the river Kanhan (near Kamthee), several stone artefacts and well-preserved fossils of *Bos namadicus* were collected by G.L Badam along with his team. Rich assemblage of Stone Age tools was also traced at Wadi and Dattawar in the vicinity of Nagpur.

35. EXCAVATION AT MANSAR, DISTRICT NAGPUR.— The Excavation Branch I, Nagpur, of the Survey, under Amarendra Nath, assisted by N.C. Prakash, S. Prathapachandran, Ch. Babjirao, N.K.S. Sharma, P.M. Bhope, H.J. Barapatre, S.K. Gulrandhe, R.G. Nagurwar, D.K. Kasbi, D.S. Sambharkar, S.M. Khairkar, A.E. Keshwar, Shahid Akhtar and D.A. Kamble carried out excavation at Mansar (21°24' N; 49°17' E). Situated 45 km north-east of Nagpur, it could be approached by National Highway No.7, leading to Jabalpur and also by rail on the Kanhan-Ramtek section of South-Eastern Railway. The first extensive survey at the site was carried out by T.A. Wellsted as early as in 1933, which brought to light antiquarian, epigraphical and structural remains of the Vakataka period around Hidimba tekadi. To the east of this hillock, structural remains of a great monastery were noticed. After four decades, an image of Siva Vamana mistaken as Kubera or Jambhala *(1972-73,* p.59, pl.XLIIB) was recovered.

Trenches across the so-called great monastery site were laid with a view to (i) ascertaining the nature of structural remains, (ii) determining its layout and assessing the architectural merits, and (iii) establishing contextual relation of sculptural finds with that of the structural remains (fig. 11). In

order to achieve these objectives, excavations were conducted on the western slope of the mound by opening up trenches D7 to J7, F6, G6, F8 to H8 and G9 to J9 (pl.XXVII). These cuttings have revealed a portion of massive burnt-brick structural complex in mud-masonry with *ratha* projections, tentatively showing three phases of constructional activities.

The structural activities of phase 1 have been noticed in the cuttings H7, H8 and G7, comprising core area, showing western elevation of moulded *adhishthana,* couple of *sopanas, pradakshinapatha* and an entrance to the complex. The core area seems to have been free-built over a knoll, taking advantage of its natural height which in course of time proved disadvantageous to the sturcture as a whole (pi. XXVIII). On either side the flanking *sopanas* leading to *adhishthana* consisted of fourteen steps. The *pradakshinapatha* was demarcated by a parallel wall, its pathway bearing traces of lime-mixed brick-jelly floor. The entire complex seems to have been enclosed by a *prakara-v/al* with low balustrade entrance in the corner of western wall.

In the second phase of construction, the *adhishthana* seems to have been enlarged without disturbing the original ground plan of core area. The western exterior of the *adhishthana* is bedecked with offsets *(devakoshthaka)* and pilaster mouldings (pl.XXIX).

In phase III, the *sopanas* leading to the floor of *adhishthana* were found closed by raising regular walls across them and ultimately filled with brick-bats. Above the *adhishthana,* portions of a porch and subsidiary shrines on its northern and eastern segments have been noticed. The floor of the porch had thick burnt deposit suggesting one of the possible reasons of decay of the establishment; two *in situ* remains of burnt wooden-post bear testimony to a large-scale burning at the site. The shrine to the north consisted of three multi-faceted pedestal-like platforms while the shrine of eastern segment comprised dilapidated pedestals with sealed clay images largely damaged. A few large-sized standing clay images of divinities and *dvarapalas* were found in shambles with crest-fallen. A few sculptural fragments which could survive the onslaught were of great iconographic value in determining the religious affinity of the structure to a great extent.

In order to protect the massive free-built core area of the complex from the vagary of nature, it appears that oblong box-like construction of ramp-walls were envisaged on the western flank. Each one of the ramp-walls emerging at regular intervals, at right angle, was an offshoot of a common wall of shorter axis, ultimately terminating against the western profile of *adhishthana* in support of core area. It seems a natural gradient was given from core area to further west towards the shorter axis wall. Subsequently, the space between the walls appears to have been systematically filled with stone chips and ferruginous clay, again maintaining the natural gradient.

Unlike the entrance of phase I, a massive burnt-brick pillared entrance, asymmetrical to the enclosed shrine, was noticed in the cuttings of E7. It raises the possibility of tumbling upon some other structural complex stratigraphically anterior to the one noted above (pl.XXX).

The ceramic types were characterized by red ware of medium fabric, unoxidized dull red ware of same fabric, gritty micacious red ware of coarse fabric and polished red ware of fine fabric. The shapes comprised vases with distinctive offset-neck, vases with flared and out-turned rims, vases with globular body and splayed-out rims, vases with chamfered rims, storage-vases with thick base

and beaded rims, carinated *handis* with short vertical necks and outcurved rims, basins with featureless rims, bowls with corrugated profile and incurved rim occassionally bearing green slip on both sides, lids with flat circular knob and incurved featureless rim, lid-cum-bowls, beaked and plain earthen lamps. The shapes of polished red ware were confined to long-necked sprinklers and vases. Spouts of different types represented various shapes with some luting marks. The decorated pottery of the site was exclusively of medium fabric red ware with occassional mica slip on the exterior showing three types of decorative patterns *viz.,* incised, stamped and applique decoration. The incised decorations outnumbered the rest and the design element comprised a series of obliquely aligned slashes, dented lines, converging lines, notches and circlets. The stamped variety was confined to floral motifs while the applique type represented by rows of converging strokes and random wavy lines (pl.XXXI A).

Among the important numismatic finds, mention may be made of a silver portrait coin and a couple of coin-moulds, attributed to the Kshatrapas. Besides, a few circular copper coins, one attributed to the Vakatakas and the other to the Indo-Sassanians were also recovered. There were reported a number of sculptured objects from the porch and shrine floors. Notable among these included Uma-Mahesvara (pl.XXXIB), Lajjagauri (pl.XXXIC) and a plaque depicting *padapitha* (pl.XXXIIA) with other auspicious signs. Apart from this a sizable number of clay figurines including faces of divinities and demons, tortoise and moulded human skull (pl.XXXIIB) have been collected. Among other associated finds mention may be made of ornaments in the form of beads, pendants, ear-rings and studs (pl.XXXIIIA), trinklets in silver, copper, terracotta and silicious material (pl.XXXIIIB), glass and shell. Iron objects which outnumbered all other objects comprised nails, fish plates, chains, spatula, needles, handles, clamps, hoes, axes, rods, angles, points, chisel, hook and ferrule etc. (pLXXXHIC).

On the basis of numismatic data, the site may tentatively be assigned to a period between AD 300 and 650.

36. EXPLORATION IN DISTRICT NAGPUR.— Ismail Kellellu of the Department of Ancient Indian History, Culture and Archaeology, Nagpur University, Nagpur, during the course of his exploration discovered a few Middle Palaeolithic sites at Nandanwan colony, Methodist church compound and Bajaj Nagar localities in the city.

At Nandanwan colony, the tools comprising different types of scrapers, points, borers, chopper and handaxe, were collected from the earth dug out for constructing a well at a depth of 9.14 m below surface. All the tools were made on chert nodules and flakes.

In the Methodist church compound behind the Vidarbha Cricket Association's ground, typical Middle Palaeolithic tools were collected from the surface.

A trench (1.87 x 1.20 m), laid for a water pipeline in the north-east of Bajaj Nagar, yielded a small handaxe on quartzite and chopper, scrapers, points, blades and borers made on chert in a stratified context. The tools were fresh and made on nodules, cores and flakes.

Also noticed were a group of Megalithic burials at Aathva-milestone, about 11 km from Nagpur and 3'/2 km from the University campus on the Nagpur-Amravati road in the fenced premises

of the MSEB power station. Besides the usual stone circle type, the group also consisted of cairn - circles (similar to Khairwada burials, District Wardha). On close examination, some of the stone circles betrayed interesting surface features like passage connecting the central dome-like filling and the boundary stones. Excavation of these circles might reveal some new architectural features hitherto unknown in this part of Maharashtra.

Pradeep Meshram of the same Department discovered a Brahmi label inscription of the first century BC at Pullar in Bhiwapur tehsil. The inscription, found engraved on a stone pillar lying in the fields near a rock-cut cave, contains four letters and reads *vandalasa.* Four rock-shelters including a monolithic cave at Ramgarh about 6 km from Kondhali and 48 km from Nagpur on Nagpur-Amravati road was also discovered by Pradeep Meshram. The largest shelter measures 16.76m long, 3.96 m wide and about 2.43 m high. The size of the other shelters is 1.21 mx3.04m. On the basis of the architectural features these caves may be assigned to *circa* first century AD.

37. EXCAVATION AT CHACHEGAON, DISTRICT SATARA.— The Aurangabad Circle of the Survey, under the direction of P.N. Kamble, assisted by M.Mahadevaiah, M.R. Dhekane, D.N. Sinha, D.L. Sirdeshpande and V.R. Satbhai resumed scientific debris clearance of the Buddhist caves at Chachegaon. Two *viharas* with single cells were taken up for clearance. In addition, the cells flanking the *chaitya* facade on its right side was also exposed partially. During the clearance stray potsherds of medieval period consisting of red ware and black ware were found. The interior of *chaitya* could not be taken up for further digging because of accumulated water inside.

38. EXPLORATION IN DISTRICT WARDHA.— Pradeep Meshram of the Department of Ancient Indian History, Culture and Archaeology, Nagpur University, Nagpur, discovered remains of a brick stupa on a hillock at Seldoh in Seloo tehsil near Keljhar. On the basis of the size of bricks, the stupa could be assignable to later Satavahana period. The diameter of the stupa is 28 m. Only a few traces of foundation exists now, and the place is being visited by the local people every year on the Mahasivaratri day.

MANIPUR

39. EXCAVATION AT SEKTA, DISTRICT IMPHAL.— O. Kumar Singh of the Department of Anthropology, D.M. College of Science, Imphal, with the assistance of S. Bheigya Singh, S. Rupoban Singh and K. Indrani Devi of the Department of Archaeology, Government of Manipur, conducted excavation at an urn-burial site, located in village Sekta (94°24" N ; 24°53' 24"E), eighteen km north-east of Imphal on the left bank of river Iril.

There were altogether eight layers exposed in Qd 1 at a depth of 2.25 m which revealed a few hand-made pots impressed with a carved paddle comprising herring bone, chevron, diamond, ribbed designs and incised or applique bands.

The presence of bones and skull fragments suggested the practice of secondary, burial although there was no indication of burning. The skulls in general were facing north, south and west. The burials were done by depositing the earth to cover the pots preceded by some rituals. The sizes of burial-pots vary, the bigger jars were buried after a shallow digging, without a definite alignment

of pots. In most of the burials, limb bones along with a skull each were placed in separate jars. Two skulls with or without mask were found entered into separate jars and buried in a single burial. A few burials contained only some grave goods and sandy soil. But for beads which were present throughout, the grave goods also point to some variation as may be noticed from the occurrence of ear and finger rings, bangles, armlets, etc. In the burials of later period, implements of iron *viz.,* spear-heads, knives, etc., were also found. In the top layers there were fragments of glazed ware and porcelain.

The observation on the cranial morphological characters of the skull exhibited the physical tracts like prominent molar bone, traced on rudimentary supraorbital ridge, broad as well as narrow orbital cavity, rounded and pointed chin, medium high and broad or narrow-forehead, receding forehead and some long head, broad head and nose etc.

NAGALAND

40. EXPLORATION IN PHEK-WAZHEHO, NAGALAND.— The Directorate of Art and Culture, Government of Nagaland in collaboration with the Department of History and Archaeology, North-Eastern Hill University, Nagaland and the Department of Anthropology, Science College, Kohima, jointly conducted exploration in the Phek-Wazheho area (94°30' E; 25°40' N), bordering Myanmar and Manipur under T.C. Sharma assisted by Zunezo, Y. Ladong and Wati Jamir.

The area, drained by river Tizi, flowing into Chindwin of Myanmar, was composed of high and steep ridges of Tertiary sandstone interposed with deep gorges, all covered by thick vegetation. The hill ranges rise to altitudes varying between 1510 and 1230 metres. In the Wazheho area there were intrusive ultra basic rock-like diorite and serpentine and deposits of limestone and chert of olive green colour. The top of the hill ranges were dotted with villages inhabited by Chakhesang Naga tribe in the Phek area and by Puchury Nagas in the Wazeho area.

The explorations resulted in the discovery of Neolithic sites near Phek Basa and Shatuza villages as well as in Wazheho cement factory area. The surface collection from these sites included ground polished stone tools made of olive green chert, large quantity of pottery and some grinding stones. The pottery was crude and hand-made, of clay mixed with stone grits and sand. The cord-impressed grey pottery was the dominant ceramic type of the area.

ORISSA

41. EXCAVATION AT BARABATI FORT, DISTRICT CUTTACK.— In continuation of earlier work *(1993-94,pp.*84-88), K. Veerabhadra Rao, assisted by A.K. Patel, N.K. Sinha, M.P. Singh, Bhagaban Behera, S.K. Bhoi and R.N. Sahoo of the Excavation Branch-IV, Bhubaneswar, of the Survey, resumed excavations on the southwestern side below the tower which revealed a retaining wall of the earlier period, that was raised to protect the structures from the ravages of flood. The exposed wall (17.75 m) in north-south orientation had step-like appearance on the outer face, while the inner face was not in plumb line. The ground on the eastern side of the wall was raised by filling as the height of the retaining wall increased. The wall (1.65 m) built of dressed laterite blocks (80 x 40 x 25 cm), consisted of seven courses, each successive course was laid after leaving a ledge on the bottom course

giving the appearance of steps on the outer face. The wall was covered by the floor-slabs of the inner structure.

The structure, east of the retaining wall was similar to the structures found on the southern side of the citadel unearthed earlier. All these structures, sometimes with moulded-base comprised a strong plinth built of laterite stones and veneered with creamy white khondalite stones. The retaining wall designed to protect the structures from the scouring effect of the flood waters was a precursor to the massive retaining wall of the palace built on heavy foundation columns of Period III. There was also evidence of stone floor, parallel to the apron of the citadel of Period III.

A laterite structure (pi.XXXIV A) with mouldings at the base was traced inside the compound wall of the Conservation Assistant's office. The structure could not be exposed completely in this area, because of construction of a toilet-block and septic tank.

The ceramic industry mainly represented by shallow bowls of Chinese porcelain (pl.XXXIV B), painted with designs like house, trees, birds and butterfly in blue inside. Fragments of small bowls with straight edge in white porcelain, and dishes in creamy white porcelain with a cracked appearance of the vitreous slip were also found. Besides, there were fragments of large shallow thick bowls with plain rounded rim made of fine clay, buff inside and the outer surface of dull red colour. But these were not glazed.

One fragmentary bowl with a ring-base has paintings in polychrome. Not a single specimen contained Chinese characters. In addition, there were also found sturdy grey ware of medium fabric, grey ware with sandy grit, dull red and red-slipped ware, all wheel-made and fragments of lathe-turned soapstone vessels. The shapes included mainly *handis,* vases, basins, small vessels with carination, spouted vessels, vases with corrugated neck, *surahis* and even receptacles of *hookahs* (hubble-bubble). One specimen of very shallow dish, black inside was probably used as a hot plate or *taw a.*

It is interesting to note that even today the *bhog (prasada)* is being offered to Lord Jagannatha at Puri in earthen ware only and such shapes as basins with round bottom still exist.

Among the antiquities mention may be made of a copper coin deeply patinated with bluish green accretion, a badly damaged female figure made on creamy white khondalite and a fragmentary terracotta figurine depicting an elephant besides a stone-lamp carved out of schist with a lotus motif at the bottom and figures of elephant all around.

No evidence has so far been found to substantiate *Madalapanji,* a chronicle kept in the temple of Jagannatha at Puri, that the city of Cuttack was founded in AD 989, though the earliest structures belonging to Period I, were not later than thirteenth century. It was first referred to in the Nagari plates of Ananga Bhima Deva, the Eastern Gangaking (AD 1211-38), in connection with the consecration of the temple of Purushottama. The later Puri plates of NarasimhalV of the same dynasty (AD 1378-1400) also referred to a palace at Abhinava Varanashi Kataka. The capital was perhaps shifted to Barabati during his reign.

42. EXCAVATION AT KHALKATAPATANA, DISTRICT PURI.— K.Veerabhadra Rao of the Excavation Branch IV, Bhubaneswar, of the Survey, assisted by A.K. Patel, N.K. Sinha, M.P. Singh, Bhagaban Behera, S.K. Bhoi, R.N. Sahoo and Jagabandhu Das conducted excavation at Khalkatapatana (86°2' 10" E ; 19°51' 20" N), situated at a distance of 11 km from Konarak on the Konarak-Puri Beach road. The site lies on the left bank of the river Kushabhadra which meets the sea, 1 km ahead behind the Ramachandi temple. The site extends from Khalkatapatana village to Garudesvar temple and beyond, covering a kilometer and potsherds could be collected from the either side of the Beach road wherever it cuts across the mounds and also from the road to the river bank. The excavation of the site was preceded by surface study of the site for any possible remains of structures. Further exploration in the neighbourhood revealed Tundupada Banta, Beruhan and Bangali Banta to have similar vestiges. While Tundupada Banta is nearer, Beruhan and Bangali Banta are few kilometers away from Khalkatapatana to the west.

Earlier a small-scale *(1984-85,* p.59) excavation was conducted here to establish the cultural sequence of the site. It was found to be a single culture site with maritime contacts. In the light of the above findings, the excavation was taken up to find out whether Khalkatapatana was a centre of maritime trade and acted as a port-town. Accordingly, trenches were laid at five locations depending on the surface indications. While the trenches, on the left bank of the river Kushabhadra (KPT-I) and near the Garudesvar temple (KPT-III) revealed no trace of maritime activity, on the northern side of the Ashram at a distance of 200 m near the ring-wells (KPT-IIA and KPT-IIB), on the mound Tundupada Banta (KPT-IV) and in the premises of Ashram on its southern side (KPT-V) yielded considerable data.

As the site was not regularly occupied, no floor levels or structures could be encountered in any of the trenches, though potsherds, terracotta beads and Chinese Celadon have been found. No structure could be traced near the ring-wells (KPT-IIA and IIB) where the thickness of the deposit was more. The sites were probably occupied seasonally by the people who lived in semi-permanent thatched houses depending on the trade activities. Tradition ascribed that the people from Orissa used to visit Bali in the far-east during *Karttika poornima* which event is now celebrated with much nostalgia as Bali *jatra.* Khalkatapatana might be humming with activities during the months of November-December when the ships were sailing to the east. Structural activities at Konarak by the contemporary ruling dynasty, the Eastern Gangas might have also contributed either directly or indirectly to the sustenance of Khalkatapatana and with their decline, the importance of Khalkatapatana might have faded into oblivion. This evidence was also corroborated by the fact that in the sixteenth century maps there is no reference to Khalkatapatana, though Manikpatana to its south, has been mentioned as a port-town.

The ceramic industry, represented by Chinese Celadon with colours ranging from light blue to bluish green, included shallow bowls, dishes and plates (pi.XXXV A). One specimen of a plate with flaring rim intended to give the shape of lotus petals. Other varieties included small shallow bowls, creamish white in colour and pressed in moulds. The rim was not given the vitreous slip or sometimes the slip was deliberately removed on lathe; pieces of creamish white porcelain with cracked glaze were also found. Another interesting procelain variety consisted of a fragment of a

small white cup with ring-base and of thin section made of fine clay. Dark yellowish brown shallow bowls with remnants of handles with glaze on both sides or only on the outer surface were also found. The indigenous pottery comprised sturdy grey ware, dull red ware of medium fabric and orange red-slipped ware. The main shapes included *handis,* vases, bowls and bowls with lug handles, all wheel-made. Some sherds contained dark brown rough vitreous coating on the outer face and were thin in section. But their shape could not be determined due to the absence of rim portion.

Among the important antiquities mention may be made of two Chinese coins with a square perforation at the centre while one was picked up from the surface near the ring-wells, the other was found during excavation on the southern side of Ashram (KPT-V). Besides, there were terracotta animal figurines, spherical as well as arecanut beads, with collar on one side and glass bangle pieces. In the absence of any inscription, the chronology of the site could be fixed between twelfth century and fifteenth century on the basis of white Chinese porcelain and copper coins with a square perforation at the centre, dated elsewhere (Hampi, Karnataka) to the fifteenth century AD. The deluxe Chinese ware was, however, conspicuous by its absence. The site was probably abandoned after fifteenth century, which also coincides with the down fall of the Eastern Gangas.

43. EXPLORATION IN DISTRICT PURI.— K. Veerabhadra Rao, assisted by N.K. Sinha, M.P. Singh, S.K. Bhoi, R.N. Sahoo and Jagabandhu Das of the Excavation Branch-IV, Bhubaneswar, of the Survey, explored the region around the Sun Temple, Konarak and brought to light the following medieval sites of archaeological importance.

Site	*Taluk*	*Nature of remains*
Bangla Banta (86°3'33" E ; 19°53'28" N)	Nimapara	Thin deposit of sand-dune; grey and dull red wares similar to those of Khalkatapatana and a fragmentary copper bangle
Beruhan (86°3'51" E ; 19°53'26" N)	-do-	Mound and pottery comparable to Khalkatapatana and pieces of bangles; loose sculptures of Trivikrama, Ananta and Ganesa
Chitrasori (86° 10'50" E; 19°54'27" N)	-do-	Walls of late medieval temple built of khondalite stones with the presiding deity called Chitresvara
Jagesvari (86°12' 12" E; 19°57' N)	-do-	Sculptures, architectural fragments of late medieval period; fragmentary sculpture probably part of a *vyala* (being worshipped in the temple)

Site	*Taluk*	*Nature of remains*
Madhipur (86°5'29" E; 19°53'42" N)	Nimapara	Remains of Trivenisvara temple (medieval period); images of Karttikeya and Ganesa on the western and southern sides of the *koshthas;* a huge *mithuna* sculpture on the north-east of the temple (pl.XXXVB). probably brought there from the ruins of Konarak
Ramachandi (86°3'4"E; 19°51'13"N)	-do-	Medieval pottery and brick-bats encrusted with sea-shells
Tundupada Banta (86°2'31" E; 19°51'18" N)	-do-	Grey,dark grey and orange red wares of medium to fine fabric and Celadon ware

PUNJAB

44. EXCAVATION AT BRASS, DISTRICT FATEHGARH SAHIB.— In continuation of the previous year's work *(1993-94,* pp.90-91), the Department of Cultural Affairs, Archaeology and Museums. Government of Punjab, Chandigarh, resumed excavation at Brass under the direction of K.K. Rishi, assisted by Kuldip Singh, Gurdev Singh, Pardip Singh, Heera Singh and Rajinder Singh which revealed a sequence ranging from the Harappan to medieval periods. The cultural activities of the Harappans were noticed on the virgin soil, buried under the deposits of about 10 m of later cultures. The Harappan pottery was generally sturdy, well-fired and wheel-made with red surface, represented by dish-on stand, amini beaker, miniature pots and fragments of storage-jars. Though the pottery was found in abundance in a small area measuring 2x2 m this sandy deposit did not appear to be a habitational one, as the pottery was water-logged and rolled. Presence of a few rims of different types and shapes clearly indicated that during this period there was a water stream, perennial or seasonal on whose bank the Harappan folk had settled. The evidence of sandy deposit also confirmed this hypothesis. A few pieces of faience bangles and terracotta objects were also recovered.

The next phase—a village culture with agriculture-cum-pastoral base was marked by the use of PGW, wattle-and-daub houses or thatched huts. The sherds of PGW of fine-grained and well-levigated clay, painted in black with different designs such as oblique and criss-cross lines, semicircles, concentric circles, dots and dashes, spirals and short spirals and sigmas were collected along with the associated red wares mainly represented by cooking vessels. The shapes in PGW comprised *thali, lota* and *katora* etc. Some finds like proto-glass beads, *ghata-shaped* terracotta beads, semiprecious stone beads, shell and terracotta objects were also recovered. In Trench A2, some pits of PGW, ashy in nature, contained sherds of this culture along with Black-slipped and grey ware sherds. At a depth of 5.55 m, animal bones were traced in a circular pit. In association with PGW, sherds of Black-slipped and grey ware were also recovered. The two last mentioned types

gradually diminished in the lower levels unlike PGW and associated red wares. This shows the affinity between these two distinctive cultures. The constructional activities in the upper levels were limited only to some *kachcha* bricks. The total deposit of this phase varied between one to one and a half metre.

The cultural deposit of the Sunga-Kushan period with constructional activities divisible into five to six phases in *kachcha* and *pacca* bricks have also been unearthed during the excavation. The constructional activities were at its zenith during this period. In the earlier levels, the houses made of *kachcha* bricks with hearths and ovens, were exposed. The houses of this period were small and congested. In two trenches, more than ten *chulahs* in different shapes and sizes in and around these small rooms were traced in 20 x 20 m area, indicating it being densely populated. The constructional activities in baked-bricks with thick and long walls were also unearthed at some places. Originally the walls were of mud-bricks. There were a few burnt-brick houses, rectangular in shape enclosed within a thick wall which were perhaps administered by a village chief or a wealthy person.

Most striking discovery of this season was the oval-shaped burnt-brick structure connected with small rooms on either side in trenches El and ZE I. Excavation was done in half portion of this oval-shaped structure. In all thirty-five courses of burnt-bricks were exposed. Interestingly, no inlet or outlet was traced there. There was also an outer burnt-brick wall of oval shape around this structure which was also connected with another oval-shaped structure in the inner side. A bone stylus and charcoal were collected from the inner half of the oval-shaped structure. The utility of this oval-shaped complex is yet to be established. Among the significant finds mention may be made of terracotta human and animal figurines, toys, bowls, wheels, gamesmen, beads of agate, carnelian. shell, ivory, stone, terracotta, etc. Some copper coins were also recovered besides pottery, with some conventional designs and shapes. The distinctive ceramics of this period comprised the typical incurved bowls.

After a gap of many centuries, the constructional activities started on the mound again during the medieval period. Structures with brick-bats were exposed during the excavation indicating a poor living condition. Typical knife-edged bowls and glazed ware sherds along with other shapes like *lota, surahi,* cooking vessels, *kunalis* etc., comprised the main types of this period. Antiquities from this period included antimony rods and coins of copper, beads of semiprecious stones, copper, terracotta, paste, shell; bone stylus; terracotta animal and human figurines besides some miscellaneous objects.

45. EXPLORATION IN DISTRICT SANGRUR.— D.K. Handa and Lalman of the Department of Ancient Indian History, Culture and Archaeology, Punjab University, Chandigarh, during the course of exploration at Sunam, collected the sherds of pre-Harrappan, PGW. Black-slipped. Sunga-Kushan, Gupta, early medieval and Muslim glazed wares, besides some terracotta figurines of the early historical period and fragmentary stone sculptures of the medieval period, indicating the existence of Vaishnava and Saiva shrines. Also collected were the silver coins of Huvishka, Vasudeva, bull/horseman type, *Adi-Varaha* type, base coins of Bhoja Pratihara and copper coins of Yaudheyas, Somaladevi, Humayun and Akbar, *billon* and copper coins of Ghazni, Delhi Sultans, Dutch, Sikh and Kashmir.

At Satauj, 15 km from Sunam were traced the late Harappan pottery, terracottas, Sunga-Kushan red ware and bricks in addition to the remains of medieval period.

From Mard Khera, almost 5 km from Sangrur, on the main road to Bhawanigarh and Patiala, were collected the late Harappan pottery, terracotta cakes, in addition to some fragmentary sculptures of early medieval times.

TAMIL NADU

46. EXPLORATION IN DISTRICT CHENGALPATTU-M.G.R.— During the course of village-to-village survey, G. Thirumoorthy of the Chennai Circle of the Survey, brought to light the following antiquarian remains.

Taluk	*Village*	*Nature of remains*
Cheyyur	Cheyyur	Loose sculptures of *linga, nandi* and two Siva temples of *circa* tenth century with inscriptions; Subrahmanya temple of *circa* fifteenth century; Vishnu temple of *circa* seventeenth century
-do-	Kannimangalam	Fossils of wood, microliths, Megalithic stone circles and dolmens
-do-	Mukundagiri	Vishnu temple; loose sculptures of *linga* and *nandi* of *circa* seventeenth century
-do-	Nallamur	Upper Palaeolithic, microliths, Megalithic stone circles, dolmens and cairn circles
-do-	Palavur	Upper Palaeolithic; Neolithic; Megalithic stone circles, dolmens, menhirs, spreads of iron slags
-do-	Perukkaranai	Megalithic dolmens, ruined Siva temple of *circa* eighteenth century and inscription of nineteenth century
-do-	Sengattur	Wood fossils; Middle Palaeolithic tools; microlithic; Megalithic urn-burials
Madurantakam	Kinar	Somaskanda panel of *circa* eighth century; Siva temple of *circa* sixteenth century
-do-	Kolattur	Megalithic stone circles, cairn circles, dolmens and menhirs

Taluk	*Village*	*Nature of remains*
Madurantakam	Nettrambakkam	Megalithic stone circles; loose sculpture of Durga, Siva temple and sculpture of Hanuman (*circa* eighteenth century)
-do-	Peruveli	Upper Palaeolithic; Neolithic; Megalithic stone circles, cairn circles, dolmens, menhirs; *linga* of *circa* fourteenth century
-do-	Siruvambakkam	*Linga* of *circa* eighteenth century
-do-	Tonnadu	Microliths; Megalithic stone circles
-do-	Tottanaval	*Linga* of *circa* thirteenth-fourteenth century; Siva temple of *circa* sixteenth century

47. EXPLORATION IN DISTRICT NORTH ARCOT-AMBEDKAR.— Ajit Kumar of the Chennai Circle of the Survey, discovered the following antiquarian remains during the course of village-to-village survey.

Taluk	*Village*	*Nature of remains*
Arcot	Agaram	Ruined temple of *circa* sixteenth-seventeenth century
-do-	Allalacheri	Loose sculptures
-do-	Arunkunram	Inscriptions; ruined temple; loose sculptures of *nandi,* Devi, *yoni-pitha* of *circa* sixteenth-seventeenth century
-do-	Arur	Ruined temples of Siva and Vishnu with inscriptions of Parantaka Chola (AD 907-955) and Rashtrakuta Krishna III (AD 940-968)
-do-	Desipuram	Tombs and medieval habitation site
-tio>- .	Kalavai	Temple with inscriptions of Chola period and loose sculptures of Brahma and Devi

Taluk	*Village*	*Nature of remains*
Arcot	Mamabakkam	Loose sculptures of *circa* eighth-ninth century and ruined temple of *circa* eleventh-twelfth century
-do-	Melapalandai	Siva temple and loose sculptures of Vishnu, Durga, Ganesa of Nayaka period
-do-	Muppaduvetti	Siva temple and bronzes of sixteenth-seventeenth century; remains of fort with moat of eighteenth century
-do-	Pungodu	Temple of twelfth-thirteenth century
-do-	Sathur	Temples of medieval period
-do-	Sennaleri	Persian inscription
-do-	Valappandal	Temples, inscriptions, loose sculptures and bronzes of twelfth-thirteenth century
-do-	Vilappakkam	Temple, inscriptions, loose sculptures and bronzes of twelfth-thirteenth century

48. EXCAVATION AT GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— In continuation of last year's work *(1993-94,* pp. 98-100), the Chennai Circle of the Survey, under the direction of B. Narasimhaiah, assisted by R.S. Sriraman, V. Sarangadharan, S. Ashokkumar and T. Samuel Joshuah continued excavation in the mound located in front of Kalyana Mahal. In addition to the excavation, the team also undertook simultaneous conservation of the excavated remains.

During this season's work, STR-2, STR-3 and STR-4, which were partially exposed in the last season's work were fully exposed along with the enclosure wall. The enclosure wall had undergone several modifications during its use. Initially, the wall was curvishly aligned, the remains of which were traced upto 24m in length. This alignment was later straightened to run from east to west direction for a length of 49.30 m which then turned towards south and terminated at the 'Elephant Tank'. The western arm of the wall was 43m in length. The northern arm had a postern in alignment with STR-2 possibly serving as its entrance. However, this arm underwent considerable modification during phase II.

STR-2 seems to be the most important structure in the complex during both the phases. Oriented towards the Kalyana Mahal from north to south direction, this structure located in western area free of any rocks, initially had a rear hall (5.25 x 8.80 m) with a cell (2.45 x 3.20 m) at the centre and a facade-hall (2.95 x 8.80 m). The facade-hall was closed at the sides and open in front. The rear-hall had a doorway to reach the tank located behind. The structure was expanded by adding

another facade-hall (5.10 x 9.95 m) at a lower level. While the initial structure was raised using ashlar-masonry plastered with lime from plinth, the latter facade-hall was given a moulded stone plinth and was open on all sides. Interestingly, there were iron rings set in the stone joints possibly to hold temporary roof.

STR-3 — a large structural complex consisting of two residential units, integrated with two open lime-floored quadrangles, had two entrances located in the northern arm of the enclosure wall. Of the two entrances, the one on the east was elaborate in having two landings, adjacent platforms and guard's rooms, whereas the second entrance was simple with broad steps. During the second phase, enclosure wall was slightly projected at the western end.

The area (32.25 x 14.50 m) beyond the first entrance on the east possibly served as a reception area for the visitors. There was a platform (3.70 x 14.50 m) at the rear of the area, from where the entry could be made to the rear courtyard with raised platforms on three sides. The courtyard was a large lime-floored quadrangle (10.50 x 7.00 m) of a residential unit and to its west there was a three-roomed residential unit with a masonry tub (2.50 x 2.85 m) possibly for bathing purposes. This residential unit had a facade, pillared-verandah leading down to a lime-floored quadrangle, common to STR-2, 3 and 4.

Integrated within STR-3 was another large seven-roomed residential unit. The second entrance served as an exclusive approach to this unit. This unit too had two open courtyards. A , cyclopean masonry wall was raised to separate this structure from STR-2, leaving a protected passage in-between the two.

A salient feature of STR-3 was its poor construction though it was a sprawling building spread over 2500 sq m area. Rubbles, bricks, both new and reused ones, brick-bats, chunks of concrete obtained from the debris of fallen structures of the Nayaka period were freely used in mud-mortar. The walls were not in proper alignment while the units were haphazardly integrated. Possibly the whole structure was roofed with layers of country tiles. And possibly, this structure was repeatedly demolished too. This structure perhaps served as the residence of the rulers, later the chief sub-ordinate officials in charge of the fort.

STR-4, possibly a hurridly raised structure (14.75 x 10.65 m) using only concrete chunks contained two rooms and a hall. The only significant feature of the structure was a drain which originated from the hall and was taken carefully out along the parapet of the *mandapa* of the Elephant tank.

Besides exposing the structures of phase n, emphasis was also laid upon the simultaneous conservation of the structures by defining them properly. There were several problems in defining the structures, particularly STR-3, and the structural phases. Very often the walls were preserved only below the working level. Therefore, to present an idea about the plan of the structures, it became imperative to raise the walls by a few courses in the same masonry. Another measure was to recess point the joints of the masonry with combination mortar and to watertighten the core of the walls. Among the major works carried out was the reconstruction of the enclosure wall using stones retrieved from the debris, introduction of stone beams over the entrance to the well of phase I in order

to hold the walls of phase II, introduction of stone beams below the masonry of the steps of the well in place of decayed wooden beams, replacing the missing moulded stones of the plinth of the facade hall of STR-2 with new stones as per original, replacing the uprights of platforms of STR-3 with new stones.

Antiquities recovered from the excavation were few in number mainly restricted to a few iron objects like nails, door-handles, daggers, etc. The debris was essentially composed of structural materials only.

UTTAR PRADESH

49. EXCAVATION AT JHUSI, DISTRICT ALLAHABAD.— The excavation at Jhusi (25°26'10" N; 81°54'30"E) was undertaken by V.D. Misra,B.B. Misra, J.N. Pandey, J.N. Pal, U.C. Chattopadhyaya, D.K. Shukla, M.C. Gupta with the assistance of members of the technical staff L.K. Tewari, V.N. Rai, R.P. Yadava, V.K. Khatri, Kamlesh Kumar, Arvind Malviya and Sharada Suman of the Department of Ancient History, Culture and Archaeology, University of Allahabad, Allahabad, with the following main objectives: (i) to establish the stratigraphy, (ii) to study the process of urbanization at the site, (iii) to study intra-site settlement pattern, (iv) to make up total collection of antiquities from the restricted areas, and (v) to collect organic and botanical remains. The ancient Pratishthanpur is located on the left bank of the Ganga within a marked meander, very close to the Ganga-Yamuna confluence just opposite Allahabad city. The ancient site extends about 3 km along the river from the Railway bridge to Chhatanaga locality. Its breadth from north to south measures about 1.5 km. The major portion of the ancient site is occupied at present by the villages Jhusi-Kohana, Jhusi Hawelia and Chhatanaga. Originally a compact mound, has now been dissected into a number of smaller mounds by rain gullies and encroachment. The Samudrakupa mound, however, is comparatively well-preserved and has the maximum height of more than 16 m.

Exploration conducted in and around Jhusi, from time-to-time by the Department of Ancient History, Culture and Archaeology, Allahabad University, Allahabad, yielded pottery, coins, terracottas, stone sculptures, seals, sealings, bone, iron, copper and ivory objects etc. The antiquities indicated that the site had a long history ranging from pre-NBP times to the medieval period.

The Samundrakupa mound being comparatively well-preserved was chosen for excavation. A step-trench measuring 5x5 m was laid out. It was extended towards the east upto 40 m in length. The total depth was 15.5 meters which was subdivided into twelve steps of varying thickness. The excavation revealed forty-nine layers divisible into the following five cultural periods.

Period I with a total thickness of 70 cm visible in layers 47,48 and 49 was a transitional period containing sherds of both Chalcolithic and NBP Ware. This period was characterized by Black-slipped Ware, black burnished ware, red ware and black-and-red ware. A few red ware sherds contained paintings in black pigment. The common types were pedestalled bowls, deep bowls with everted rim, convex-sided and hemispherical bowls with prominent splayed-out rim, convex-sided bowls, lipped-vessels and footed and perforated vessels, etc. A few NBP Ware sherds were also found in layer 47. Burnt clay lumps with reed marks were also noticed.

Period II (layers 24 to 46) was characterized by ring-wells, burnt-brick and wattle-and-daub houses besides the sherds of NBPW of different shades and colours. Some painted NBP sherds were also found with geometrical designs. The common shapes comprised bowls, dishes, lids, basins and vases. The associated wares consisted of plain and slipped red ware, coarse black-and-red ware, Black-slipped and grey wares. The main shapes of red ware comprised bowls, dishes, basins including lipped-basins. Tumblers with straight sides and flat base, bowl/dish-shaped lids, medium and small-sized vases with concave neck, vases with carinated neck, carinated *handis* and storage-jars were other noteworthy types in the red ware. The shapes in coarse black-and-red-ware were very limited which comprised mainly the vases, storage-jars etc. Basins and bowls also occurred in limited numbers.

Noteworthy antiquities recovered from the excavation included punch-marked and uninscribed cast copper coins, terracotta animal figurines, beads and uninscribed seals and sealings with symbols, iron objects, tanged bone points, beads of semiprecious stones, animal bones with cut marks, etc.

Period III, i.e., Saka-Kushan was characterized by post-NBP red ware, Red Polished Ware, black ware and black-and-red ware as evident in layers 15 to 23. The noteworthy shapes in the red ware included knobbed-lids, bowls with flaring sides, flat thickened base, dish or basin-shaped lids or stoppers, vases with concave neck, storage-jars, dishes with flat base, flaring sides and internally bevelled-rim, basin, miniature and small vases, spouted-vessels *(surahis),* pans, carinated *handis,* some with *makara-shaped* spout, flat based beakers and goblets etc. The common types in Red Polished Ware were sprinklers and *surahis. A* few sherds were decorated with incised (both pre-and post-firing), impressed, stamped or applique designs. Some of the medium-sized vases belonging to transitional layers (23 to 21) were decorated with stamped designs consisting of either *triratna, nandipada,* wheel, geometric or floral motifs on its external surface. Circular copper coins and one terracotta inscribed seal were other noteworthy antiquities, besides beads, bangles, terracotta figurines, copper and iron objects, bone points and shell objects etc.

Layers 6 to 14 (Period IV) revealed six structural phases (I-VI), characterized by a distinct red ware turned on wheel or by moulds. In case of moulded pots *viz.,* the *surahis* and medium-sized spouted vases, different parts were luted. The characteristic shapes in the red ware included bowls with tapering sides, flat and occasionally disc-base, rounded, featureless, pointed or externally bevelled-rims, shallow dish with internally thickened rim, with flat base, basins with nail-headed or externally thickened rims, pans *(karahis)* with insignificant lugs attached horizontally to the belly on both sides, pans with lugs attached vertically at the top of the rim, convex or straight-sided basins, out-turned or splayed-out, multi-grooved rim, *surahis,* medium-sized vases with out-turned externally multi-grooved under cut rim, concave neck, square or convex shoulders, rounded body and footed ring-base. Some of the *surahis* and vases of this type bear moulded decorations on the external surface in relief within two prominent ridges. The motifs consisted of geometrical, floral, fish-scale patterns. The external surface with a restricted bright red slip or polish was treated with mica-dust or sand particles. Besides the typical Gupta red ware, the chocolate, red-slipped ware, Red Polished Ware and black ware of the preceding period were also discovered. Some of the pots comprised incised, stamped, impressed or applique designs.

In the course of excavation, in one of the rooms of structural Period II, one complete medium-sized vase covered with bowl-shaped knobbed-lid was found. Similarly in one of the rooms of structural Period VI, three large storage-jars covered with stoppers were recovered. Among the noteworthy minor antiquities of this period mention may be made of semiprecious stone beads, human and animal figurines, balls and wheels of terracotta; glass, stone and shell bangles; iron objects such as nails, arrow-heads; copper vessel and ring, bone points and arrow-heads, stone grinders, mullers and cowrie shells.

In Period V (layers 1 to 5) no structure could be found during digging, however, in the adjacent area brick-walls, belonging to two different structural periods were noticed. This period was characterized by ordinary red ware, superior in finish and firing than red ware of the preceding period, glazed ware including the biochrome glazed ware. The common shapes in the red ware were *surahis,* spouted-vessels, bowls, basins, vases, carinated *handis,* spouts, lids with hallow conical knob, bowl-shaped stopper with prominent ridge at the shoulder, stopper or bowl with prominent ridge at the shoulder and deep depression, possibly to receive a lid. In this period carinated *handis* and spouted vessels were found in large numbers. Some of the bowls were characterized by insignificant ring-base. A small percentage of pottery contained incised, stamped and applique decorations. Noteworthy finds comprised semiprecious stone beads, terracotta objects including beads and animal figurines, leaf-shaped iron arrow-heads and stone grinders.

50. EXPLORATION IN DISTRICTS ALLAHABAD AND BANDA.— The Department of Ancient History, Culture and Archaeology, University of Allahabad, Allahabad, under V.D. Misra, with the assistance from B.B. Misra, J.N. Pandey and J.N.Pal carried out explorations in the Vindhyas and Ganga Valley. The explored sites ranged from the Lower Palaeolithic to the historical periods.

Lower Palaeolithic site of Bariari on the Yamuna in Mau sub-division of District Banda was re-explored intensively. From Bariari, an extensive Lower Palaeolithic site, extending from west to east along the Yamuna, a large number of cores, flakes, handaxes, cleavers and scrapers on quartzite generally in mint condition were collected. The state of preservation of Palaeolithic tools indicated that Bariari was a primary site generally referred to as a factory site.

A Lower Palaeolithic site was discovered at Hanumandhara near Chitrakut in District Satna, Madhya Pradesh. A large number of plain and painted rock-shelters were discovered in Mau and Karwl sub-divisions of Banda and one group of rock-shelters in Bara sub-division of Allahabad. Among the rock-shelters in Mau sub-division, mention may be made of Kauakhoh and Bilari Pahari and Rishiyan or Suaria rock-shelters. Of the two rock-shelters of Kauakhoh, one contained paintings. Out of the five rock-shelters at Bilari Pahari, only two shelters were painted. At Rishiyan, there were about ten rock-shelters but the paintings were found only in two rock-shelters. These rock-shelters, situated near the villages of Belaha Kewatara and Gadariapurwa at a distance of 5 km to the east of Mau contained paintings of wild animals such as deer, *Barasingha,* human figures, hunting scenes, birds, etc., on the ceilings of the rock-shelters. In Karwl sub-division, a rock-shelter situated on the hill, on the eastern side of Siddhapur village, about 3 km to the south-east of Karwl also contained painting of wild animals. A large number of rock-paintings have been damaged due to the activities *oisadhus* inhabiting the rock-shelter.

A group of eight rock-shelters were also discovered at Janwa near Mujara tank in Bara sub-division of Allahabad on Banda-Allahabad road. A chain of seven unpainted rock-shelters running from east to west was located of which the ceiling of only one rock-shelter was painted with hunting scene, birds and human figures in ochre colour.

Agarikhera mound in Banda situated near the village of Hattam on Garara *nullah,* at a distance of 27 km to the west of Banda, was also explored. The mound covering an area of 2.50 sq km, revealed Kushan, Gupta and early medieval pottery. A large number of finished and unfinished beads of semiprecious stones along with the raw material were also collected during exploration.

An extensive early NBP site was located at Mahagaon in Chail sub-division of Allahabad, which revealed sherds of NBPW and associated wares, bone objects, beads, animal bone, etc.

A stone temple on a raised platform was discovered at Hanumanadhara near Chitrakut in District Satna, Madhya Pradesh. The temple assignable to the Gupta period, consists of a square *garbha-griha* and a portico on four stone pillars. On the door-jamb, images of Ganga and Yamuna were found carved.

51. EXCAVATION AT WINA, DISTRICT BALLIA.— The Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, Banaras, conducted small-scale excavation at Wina (locally known as Waina) under the direction and co-direction of Purushottam Singh and Ashok Kumar Singh, assisted by R.N. Singh, B.N. Singh, S.K. Singh, A.K. Pandey, Ram Badan and B.K. Sinha. This ancient site, located on the left bank of the ancient bed of Chhoti Saraju (Tons) which joins the Ganga about 3 km south-east of the present site.

The settlement of Period IA was found on the south-west corner of the mound. Four trenches (5m x 5m) were laid in this area which resulted into the identification of two sub-periods, distinguished mainly on the basis of ceramic evidence. Period IA was represented by cord-impressed red ware with spouted vessels, bowls and vases as the principal types. Besides, sherds of red burnished ware were also found with the principal shapes comprising straight-sided jars, marked by short spout *(martban)* and *lota-shaped* vessel. The pottery assemblage could be comparable to the pre-Narhan pottery found at Imlidih Khurd, located on the left bank of the Kuwana, a tributary of the Ghaghara in District Gorakhpur. This sub-period could be tentatively dated between 1600 and 1300 BC.

The sub-Period IB, marked by the pottery assemblage of Narhan culture, was characterized by white painted black-and-red ware, Black-slipped Ware and plain red ware. Traces of habitation in both sub-periods comprised wattle-and-daub huts, post-holes, ovens and storage pits. The important antiquities included bone points, beads of terracotta and semiprecious stones and pottery discs.

Period II was represented by dishes, straight-sided beakers and bowls of Black-slipped Ware, vases and lipped-basins of red-slipped ware and plain red ware. Among the NBP associated wares, dishes with incurved-rim were the principal types. The structural activity of this period comprised post-holes, wattle-and-daub huts and mud-walls. In the limited excavation, the use of burnt-bricks

as building material could not be attested. The small finds comprised iron objects, bone points and arrow-heads, beads of terracotta and semiprecious stone, terracotta balls and discs.

Archaeo-botanical samples from the two periods mentioned above, collected stage-by-stage by K.S. Saraswat of the Birbal Sahni Institute of Palaeobotany, Lucknow, revealed that an advanced agriculture was enjoyed by the settlers at this site. They were well acquainted with the rotation of crops and grew cereals, pulses and oilseeds in the summer and winter seasons. Preliminary examination of the crop remains during the course of collection of the samples from different horizons of cultural deposits from 1300 to 600 BC, revealed the presence of rice *(oryza sativa),* barley *(hordeum vulgare),* wheat *(triticum aestivum), mung (vigna radiata),* lentil *{lens culinaris),* field pea *(pisum arvense),* grass-pea or *khesari {lathycus sativus),* gram *(cicer arietinum),* field-branssica *(brassicajuncea)* and frV/seasame *(sesamum indicum).* A good number of weeds and other wild seeds found from the site, served as useful source of detailed information on the ecological surrounding of the settlement.

A large number of animal bones were collected from various strata of Period I. These have been carefully labelled and a detailed study of these osteological remains would supplement the data not only on the fauna of the period but also on the economy of the earliest inhabitants.

Period III, marked by Sunga-Kushan pottery, with sprinkler of red ware as the diagnostic type and the burnt-brick structures which have been largely robbed by present day inhabitants of Waina village. The important antiquities of this period were terracotta human and animal figurines, terracotta balls, beads and pestles; bone points; iron and copper objects and antlers.

The mound was inhabited during the Gupta period as also for a few centuries in post-Gupta times in Period IV. However, this strata was found to be highly disturbed in the three trenches exposed on the highest part of the mound. The typical antiquities of the Gupta period and characteristic pottery shapes were the only criteria to establish the nature of cultural deposits of these periods. However, it may be added that such antiquity and pottery were not found in their proper archaeological context, as a result, no vital conclusion of far reaching importance could be arrived at regarding these two periods.

52. EXPLORATION IN DISTRICT BARABANKI.— A.A. Hashmi of the Lucknow Circle of the Survey, brought to light the following sites in Nawab Ganj tehsil of District Barabanki, under the village-to-village survey scheme.

Village/Site	*Nature of remains*
Asainee	Two Siva temples (nineteenth century)
Barauli	Temple dedicated to Siva (nineteenth century)
Bhitauli Kalaun	Mosque (eighteenth century)
Barauli Malik	Siva temple (nineteenth century)

Village/Site	*Nature of remains*
Bhanmau	A tomb and a mosque (late medieval period); Siva temple (nineteenth century)
Dalloo Khera	Temple dedicated to the local goddess 'Sailanimata' (seventeenth century)
Jata	Mound yielding red ware sherds (medieval period)
Mawaiya	Temple dedicated to Siva {*circa* fifteenth century)
Mohna	Siva temple (nineteenth century)
Para Kunwar	Mound yielding medieval red ware; mosque (nineteenth century)
Rasauli	Mosque (nineteenth century)
Sarai Akbarabad	Mosque with Persian inscription (AD 1579)
Sarthara	Mosque (nineteenth century)
Satrikh	Mound yielding pottery (Gupta to medieval period); Siva temple (nineteenth century); a tomb (Sultanate period); bridge (medieval period); mosques (medieval and late medieval periods)
Sikanderpur	Siva temple (nineteenth century)
Sultanpur	Mound yielding medieval red ware
Teergaon	Medieval tomb

53. EXCAVATION AT MUSANAGAR, DISTRICT KANPUR DEHAT.— The State Archaeological Organization, Government of Uttar Pradesh, under the direction of Rakesh Tewari assisted by Rakesh Kumar Srivastava, Hemraj, P.K. Singh, Krishna Kumar Singh, Girish Chandra Singh, Raj Kumar and Rajiv Trivedi, conducted excavation at Musanagar mound in Bhoginipur tehsil. Three trenches were laid down at three different locations MSG-I, MSG-II and MSG-III. Besides, a naturally exposed section at a location (MSG IV), was also scraped from a metre inside (width of three metres) which revealed the following culural sequence.

Period I consisting 30 cm thick deposit, yielded red ware both hand-made and wheel-turned, Black-slipped and black-and-red wares. Red ware was the dominant ceramic industry of this phase with its fabric ranging from coarse to fine. Most of the sherds contained straw marks, ripples and

rustication over their outer surface. Presence of a few perforated legged-sherds were important to mention herein.

Black-slipped Ware comprised convex-sided dishes, globular bowls and straight-sided bowls. A peculiar pottery with inside red and outside black (red and black) was also present in this assemblage. The presence of burnt-clay lumps with reed impressions and a few post-holes indicated that the dwellings were of wattle-and-daub. Among other associated finds mention may be made of terracotta sling-balls and bone points.

The deposit of Period II (30 cm) was characterized by the PGW sherds. Red ware, Black-slipped Ware, grey ware and black-and-red ware comprised other associated types. Sherds bearing rusticated surface, straw marks, cord impressions, applied designs, were however, noteworthy in red ware.

Black-and-red ware consisted of both hand-made and wheel-turned varieties. Also significant was a single sherd with horizontal strokes over its upper surface in white pigment.

Straight-sided bowls, convex-sided dishes often with collared-rim and perforated legged-bowl were other main types.

A few post-holes were traced in this phase also. Other associated finds comprised terracotta balls, discs and bone points.

The thick deposit of Period III (1.40 m), characterized by the occurrence of NBPW, was further divisible into two sub-phases A and B. A few sherds of PGW were found in the 40 cm thick deposit of Period III along with other ceramic industries, such as, red, Black-slipped, black-and-red and grey wares.

In Period III-B, 1.0 m thick deposit was marked by the presence of red ware, Black-slipped Ware, grey ware, black-and-red ware, both hand-made and wheel-turned. The sherds of red ware, black-and-red ware bearing cord impression besides a sherd of NBPW with scroll design were also important.

Perforated legged-pottery, straight-sided bowls, globular bowls and convex-sided dishes were the main types of Period III. A single sherd of Black-slipped Ware consisted of painted white strokes. Upper levels of sub-Period III B revealed the structures of kiln-burnt bricks. The presence of roof-tiles in considerable number provided clear idea about the architecture of the residences. Terracotta sling-balls and discs, human figurines and bone points comprised other notable finds.

The characteristic ceramic industry of Period IV (1.10 m thick deposit) was the red ware of different types, represented by inkpot-type lids, bowls with inturned rim, carinated bowls, straight-sided bowls, water vessels, basins and *lota-shaped* pots, etc. An important find of this period consisted of a broken bowl with an inscription in Brahmi script on its inner base.

In Period IV, the structures were generally made of kiln-burnt bricks. A few sun-baked bricks were also noticed. The floors of the houses were laid of compact clay and brick-bats mixed with lime and clay. The upper surface was often treated with kiln-burnt bricks. Other associated antiquities

comprised terracotta human figurines and bangles, copper antimony rods, bone arrow-heads and a few iron implements.

Period V was represented mainly by the sherds of red ware consisting of bowls with straight-sided featureless rim, carinated *handi,* short-necked water vessels, spouted-vessels, rusticated vessels and sherds bearing auspicious symbols. Terracotta moulded human and Naigmesa figurines, balls and bangles, copper antimony rods and bone points etc. were also recovered from the deposits of Period V.

54. EXPLORATION IN DISTRICT PITHORAGARH.— S.K. Dubey, under the guidance of Rakesh Tewari and Hemraj of the Regional Archaeological Unit, Almora, of the State Archaeological Organization, Government of Uttar Pradesh, brought to light the following archaeological sites under the village-to-village exploration in Pithoragarh tehsil.

Site/Village	*Nature of remains*
Aincholi	A stone-built *naula* (late medieval)
Hureti	A stone-built *jaladhara* (water source) and sculpture of Vishnu (medieval)
Kharkini	Fragmentary image of Vishnu and red ware (late medieval)
Kotali	Stone sculpture of Mahishamardini (eleventh-twelfth century)
Lunthura	A stone-built *naula* (late medieval)
Malan	A stone-built *jaladhara* (late medieval)
Paur	Two stone sculptures of Vishnu {*circa* eleventh century)
Roda	Stone sculpture of Surya (eleventh-twelfth century)
Rodi	Two stone sculptures of Mahishasuramardini and one sculpture of Vishnu (medieval)
Ruino	Red ware (medieval)
Valkot	*Chaitya-arch* with Siva flanked by two *vyala* figures

55. EXPLORATION IN ANCIENT MANSAROVAR ROUTE, DISTRICT PITHORAGARH.— In continuation of the previous year's *(1993-94,* pp. 115-118) work, S.K. Dubey of the Regional Archaeological Unit, Almora of the State Archaeological Organization, Government of Uttar Pradesh, resumed

exploration in ancient Mansarovar route from Thai to Askot, under the general guidance of Rakesh Tewari and Hemraj and discovered the following sites of archaeological importance.

Site	*Nature of remains*
Adityamandir-Mar	Temple of Surya with subsidiary shrines containing stone sculptures of Surya, Mahishamardini and Ganesa (medieval)
Dagari	A stone temple {*circa* eleventh century)
Deval	Stone sculptures of Lakshmi-Narayana, Vishnu and Surya {*circa* thirteenth century)
Hat .	Ruins of a temple (medieval); cup-marks; stone sculpture of Vishnu and four carved pillars (medieval)
Kiroli	Two sculptures of Parvati (medieval)
Mirthi	Red ware (medieval); temple; stone sculptures of Uma-Mahesha and *seshasayi* Vishnu {*circa* fourteenth century)
Narayan Deval Bastari	Temple {*circa* fourteenth century)
Narayan nagar	Stone sculpture of Vishnu; fragmentary pieces of icons of Hindu deities (medieval)
Talli Pamsyari	Stone sculpture of Parvati, Vishnu, Mahishamardini and Ganesa (medieval)

56. EXPLORATION IN DISTRICT SULTANPUR.— Indu Prakash of the Lucknow Circle of the Survey, brought to light the following sites of archaeological importance during the course of village-to-village survey.

Village/Site	*Tehsil*	*Nature of remains*
Alamau	Musafirkhana	Mound yielding pottery ranging from Sunga-Kushan to medieval period
Arawal	-do-	Mounds with red ware sherds (medieval); gosain *mathas* (nineteenth century) and sculptural fragments (medieval)

Village/Site	*Tehsil*	*Nature of remains*
Bhawanipur	Musafirkhana	Mound with pottery (late medieval) and a Dargah (nineteenth century)
Dadra	-do-	Mound with red ware sherds (medieval); a renovated temple of Higulaj Devi (late medieval)
Gaura Parani	-do-	Mound with red ware pottery ranging from Kushan to medieval period
Isauli	-do-	Qila mound with sherds of NBPW, Black-slipped Ware, associated red ware and glazed ware; a mosque (Nawabi Period); Dargah and Imambara (nineteenth century)
Kailashpur	-do-	Gosain *mathas* (nineteenth century); a temple with *Siva-linga* (medieval)
Kudili	-do-	Gosain *mathas* (nineteenth century)
Loharia	-do-	Mound with red ware sherds (medieval)
Pataila	-do-	Stone sculpture of Durga *(circa* tenth century)
Pipri	-do-	Red ware sherds and fragmentary stone sculptures (medieval)
Pure Mohammad	-do-	Grave built *of lakhauri* bricks (nineteenth century)
Rampur	-do- .	Mound with potsherds (late medieval)
Umara	-do-	Mound with sherds of NBPW, Black-slipped Ware, grey ware, associated red ware, Kushan red ware and brick structures

WEST BENGAL

57. EXPLORATION IN DISTRICT BANKURA.— Tapanjyoti Chakraborty of the Calcutta Circle of the Survey, discovered the following sites of archaeological importance in course of village-to-village survey.

Village/Site	*Police Station*	*Nature of remains*
Dwarika	Bishnupur	Brick temple (late medieval)
Marar	-do-	Brick temple (late medieval)
Mathura	-do-	Brick temple (late medieval)
Turkisitarampur	-do-	Brick temple (late medieval)
Barmagura	Onda	Brick temples and *rasa-mancha* (late medieval)
Baruipara	-do-	Brick-built Siva temple and Durga *mandapa* (late medieval)
Sundarnagar	-do-	Terracotta figurines and loose sculpture of *naga*
Surmanagar	**-do-**	**Brick temple** (late medieval)
Teleberia	-do-	Temple (late medieval)

58. EXPLORATION IN DISTRICT MIDNAPORE.— Santanu Maiti of the Calcutta Circle of the Survey, discovered the following archaeological sites during the course of village-to-village survey.

Village/Site	*Police Station*	*Nature of remains*
Barbaria	Bhupatinagar	Brick temple (late medieval)
Dumandanri	-do-	Brick temple (late medieval)
Manikjor	-do-	Brick temple (late medieval)

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS[1]

ANDHRA PRADESH

1. PEDESTAL INSCRIPTION, RAYADURGAM, DISTRICT ANANTAPUR.— This Kannada inscription, engraved on the pedestal of a Jaina image is now in private possession, dated Saka 1297, Ananda (AD 1375), it refers to a Jaina preceptor Sri Ratnakirtti-chandra-bhattaraka belonging to Sarasvati-gachchha, Mula-samgha, Balatkara-gana and Komdakun-anvaya.

DELHI

2. SANSKRIT INSCRIPTIONS, NEW DELHI.— Two fragmentary pieces of a slab, probably forming part of a single inscription, engraved in the Sanskrit language and late Siddhamatrika characters of eighth-ninth century AD, are presently preserved in the Office of the Superintending Archaeologist, Delhi Circle, New Delhi. Of these records, the first one refers to the installation of a deity (name lost) by a ruler *maharajadhiraja* Sri Madhava, while the second inscription refers to the pictures of kings and to the drawing of pictures *(chitra-rachana).* It also mentions the names of Bhatta-Divakara and *kayastha* Sajjana.

3. Six KANNADA COPPER-PLATE CHARTERS OF THE WODEYARS OF MYSORE, NATIONAL MUSEUM. NEW DELHI.— These were originally discovered in Karnataka and are preserved in the National Museum, New Delhi. The charters are in the Kannada language and characters of the seventeenth-eighteenth century AD.

The first of these charters refers to king Krishnaraja-Wodeyar and records the numerical system composed by the king himself *{Kanthirava-virachita-Chitraganitagala krama).*

The second charter which refers to king Krishna (i.e., Krishnarajendra), contains verses in praise of the deity Ganapati. One set of these verses is referred to as *Ganapati-nakshatra-malika stotra* and the other set as *Ganesa-kavacha.*

The third charter contains the *chaturamga* composed by the king, referred to in the record as Krishnaraja-mahipa. The passages in squares contain the details of *sarvasamkha-ratna-koscL*

The fourth charter contains verses relating to *Mrityunjaya-stotra* and *Nrisimha-stotra* composed by the king referred to as Krishnarajendra.

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[1]Information from : Madhav N. Katti, Director (Epigraphy), assisted by M.D. Sampath, M. Jayarama Sharma, T.S. Ravishankar, N.N. Swamy, C.A. Padmanabha Sastri, D.M. Nagarjuna, S.Swaminathan, Jaiprakash, K. Karuppaiah and S. Rajavelu of the Epigraphy Branch, who found, examined and reported nearly three hundred and eighteen inscriptions of **which the important** ones are noticed here.

The fifth charter contains two sets of verses, one relating to *Ramakrishn-ashtottara-satanama-stotra* and the other relating to *Sankara-narayana-ashtottara-stotra-sloka.*

The sixth charter contains two sets of squares and refers to *Kartiviry-arjun-ashtottara-chaturamga.* The king variously described in these charters as Krishnaraja, Krishna, Krishnarajendra, Krishnaraja-mahipa, etc., can be identified with Krishnaraja-Wodeyar III.

KARNATAKA

4. COPPER-PLATE INSCRIPTION, DHARMASTHALA, DISTRICT DAKSHINA KANNADA. —This copper plate inscription, preserved in the Manjusha Museum, at the place, is in the Sanskrit language and early Kannada characters. The charter belongs to the reign of king Vinayaditya of the Vatapi Chalukya dynasty and is dated Saka 608 *(ashtottara-shat-sateshu saka-var[u]sheshu)* and in the sixth year of his reign (AD 686). It records the grant of the village Kirumundame situated in Edenadu-vishaya to a number of *brahmanas* (names given) belonging to different *gotras* on the occasion of the installation of the golden *chaturmukha* in the Siva temple *{lingasya-sauvarna-chaturmukha-aropana-samaye)* at the village. The grant was made during the victorious camp *{vijaya-skandhavare)* at the request of both Alupa king Chitravahana, son of Gunasagara, who is described as *Pandya-paramesvara* and prince Kochcha-yuvaraja. The charter further states that the king, who was an ornament to both the families of Alupa and Pandya, was returning after capturing Mangalapura. In this charter Kochcha-yuvaraja is described as *Sagar-anvaya-sambhuta, Chakora-puravaresvara, dharma-yasodhara,* an ornament of his illustrious family in the ila-vishaya and as one whose valour was lauded by Pandya-paramesvara Chitravahana-maharaja.

5. HOYSALA INSCRIPTION, TENKAKARANDURU, DISTRICT DAKSHINA KANNADA.— This Kannada inscription, engraved on a slab set up near a Vishnu temple, belongs to the reign of Hoysala king Vira-Ballaladeva. The record may be assigned to the thirtheenth-fourteenth century AD on the grounds of palaeography. It states that the chief Yalame-dandanaya [ka*] of Ayyanur granted compensation *(parihara)* to the tenants *(vokkalu)* for the creation of the villages, referred to in the inscription. Karandur (the findspot of the record) is one such village.

KERALA

6. PANDUVAMSI COPPER-PLATE INSCRIPTION, THIRUVANANTHAPURAM, DISTRICT THIRUVANANTHAPURAM.— This charter is in the possession of a private antiquity collector at Thiruvananthapuram. Though the findspot is not known, the plates must have been found in some place in southern Madhya Pradesh. The charter belongs to the Panduvamsi king Mahasiva Tivar'araja, son of Nannadeva and grandson of Indravala. The inscription (pls.XXXVI-XXXVII) on palaeographical grounds is assignable to the sixth-seventh century AD. The text is in the Sanskrit language and *champu* style. The king is described as the one who obtained the lordship of the entire Kosala *(prapta-sakala-kosal-adhipati)* and as *aparama- Vaishnava.*

The charter records the grant of half of the village Karttaraka, situated in Gondaka-bhukti, along with the usual privileges, to the three *brahmanas* named Bhanusvami, Padmasvami and Yajnas vami, sons of Bhatta-Bhadresvara, belonging to *Vajasaneya-madhyandina-sakha* and *Sandilya-*

sagotra, by the king, for the merit of his parents and his own. Bopanaga is referred to at the end of the inscription.

RAJASTHAN

7. SANSKRIT INSCRIPTION, JALORE, DISTRICT JALORE.— This inscription, engraved on a pillar in the *topkhana* is in the Sanskrit language and Nagari characters of about the tenth century AD. It records the construction of two *stambhalatas* in the temple of Parsvanatha by Sri Kadudacharya along with Meghakumara for the merit of Bhatta-Dharmma-bhadanacharya.

8. SANSKRIT INSCRIPTION, PALI, DISTRICT PALI.— This inscription, engraved on the pedestal of an image, is preserved in the local museum. It is in the Sanskrit language and Nagari characters. Dated in the Vikrama year 1160 (AD 1103), it seems to record the making *oitorana* by the members of the assembly *(goshthi)* belonging to Shamderaka-gachcha. King Yasodhavala referred to in the record was probably the ruler of the area.

TAMIL NADU

9. CHOLA INSCRIPTION, KAVANUR, DISTRICT CHINGLEPUT.— This Tamil inscription, engraved on the slab of a sluice belongs to the eleventh year (AD 967) of the reign of Chola king Parthivendrapanmar (Parthivendravarman). It records the construction of a big sluice *(peruntubu)* to the lake at Abhiramaschaturvedimamgalam (Abhiramachaturvedi-mamgalam) by Chamundaiyan, son of Kotti-araiyar.

10. TELUGU INSCRIPTION, KAVANUR, DISTRICT CHINGLEPUT.—This Telugu inscription, engraved on the slab of a sluice is in the characters of the tenth century AD. It records the construction of a big sluice *(pedda-tumu,* evidently the same on which the record is found) for the big lake at Kavanur by Chamundayya.

11. PALLAVA INSCRIPTION, KIRAISATTU, DISTRICT NORTH ARCOT.— This hero-stone inscription, lying near the Ponniyamman temple, is in the Tamil language and characters. It belongs to the Pallava king Nandisuraparumar (i.e., Nandivarman II) and is dated in the thirty-seventh year of his reign (AD 768). It records the death of a hero named Vakkadi, son of Marikappapa-kilar of Vallipedu-nadu in Vikkirama [di*] ttiya-nadu.

12. CHOLA INSCRIPTION, OLUGAIYUR, DISTRICT NORTH ARCOT.— This Tamil inscription (pl.XXXVIII), engraved on a slab found near the lake in the village, belongs to the Chola king Maduraikonda-kopparakesari (i.e., Parantaka I). Dated in the twenty-third year of his reign, it states that the lake and its sluice at Olugaiyur in Olugai-nadu in Paduvurkottam, was caused to be con structed by Mavali-Vanarayan. The lake was named Prithifvi*] pad (reminiscent of the name of the Ganga king, probably Prithivipati II). It also records the gift of an *achchu* for the maintenance of the lake by the *nattom* of Olugaiyur, for the merit of Sembiyan Mavali-Vanarayar.

13. RASHTRAKUTA INSCRIPTION, TIRUMALAICHCHERI, DISTRICT NORTH ARCOT.— This Kannada inscription (pl.XXXIXA-B), engraved on a stone built into the eastern wall of the *ardha-mandapa* of a Siva temple, belongs to the reign of the Rashtrakuta king Akalavarsha (i.e., Krishna III). Dated

Saka 870 (AD 948), it registers the grant of income from taxes *(sumka)* probably from several settis,. to the temple of the deity Kalapriyadeva, built at Kandaura. It also refers to the *vyavasthe* made for the tax collection in the division of Tondainadu-48000. The record besides referring to the victory of the king over Cholikavishaya, also mentions the islands like Suvarnadvipa, Singladvipa and Kuchadvipa.

14. CHOLA INSCRIPTION, VELLORE, DISTRICT NORTH ARCOT.— This Tamil inscription, engraved on a stone found in the village Sivanathapuram in Vellore taluk, is now preserved in the Government Museum at Vellore. The record belongs to the Chola king Kulottunga (III) and dated in the seven teenth year (AD 1195) of his reign. It states that Solakulachchetti Mattan Narpattennayira-Chittirameli-Samaya-Senapati caused the erection of a temple and installed a *linga* in it. The record also refers to the excavation of a lake, construction of a sluice, after reclamation and donation of three *velis* of land to the deity.

15. PANDYA INSCRIPTION, AVIYUR, DISTRICT RAMANATHAPURAM (KAMARAJAR).— This Tamil in scription, engraved on the north wall of a ruined Siva temple in the village, belongs to the Pandya king Maravarman Sundara Pandya (I). It is dated in the fourteenth year of his reign (AD 1230) and registers the grant of lands as *iraiyili devadana* by Alagan Arulalaperumal *alias* Solagangadevar to provide food offerings to the goddess consecrated by Suriyan Pondiyan. The record stipulates that - the descendants of Suriyan Pondiyan should get the cultivating rights over the land and supply paddy to maintain the gift.

UTTAR PRADESH

16. PRATIHARA COPPER-PLATE INSCRIPTION, AMROHA, DISTRICT MORADABAD.— This copper plate inscription (pl.XXXIX C), now in the possession of an antique dealer of Amroha, is in the Sanskrit language and Siddhamatrika characters. It belongs to the reign of king Nagabhata of the Pratihara dynasty and is dated Samvat 885 (AD 828). It states that Nagabhata was the son of king Vatsaraja and queen Sundaridevi. While Nagabhata is referred to as *parama-Vaishnava* in the in scription, his father is referred to as *parama-Mahesvara.* The charter records the grant of an *agrahara* village named Sambhupallika situated in Gunapara-mandala by the king for the merit of his parents as well as of his own. The *brahmana* donees (names given) are referred to as belonging to Bharadvaja-*gotra, Vajasaneya-sakha* and *Bhatta-Prabhakar-anvaya.*

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. MISCELLANEOUS INSCRIPTIONS, HYDERABAD, DISTRICT HYDERABAD.— Among a good number of inscriptions, copied from the State headquarters, a couple of brief metrical records in Persian, mention the construction of a sara (i.e. inn)by SayyidBadru'l Amin, inAH 1239(AD 1823-24).

Of the various epitaphs, two metrical Persian records in beautiful Nastaliq hands, mention respectively, the death of a valiant personality Mirza Muhsin in AH 1270 (AD 1853-54) and an

[1]Information from : M.I. Quddusi, assisted by S.S. Hussain, M. Yaseen Quddusi, G.S. Khwaja and M.A. Siddiqui, who copied, examined and reported two hundred and sixty-seven inscriptions during the year under review, out of which important ones are noticed here.

unexampled learned figure Mui 'du' d Din Khan, in AH 1283 (AD 1866-67). Two more Persian epitaphs, forming as obverse and reverse of the same headstone of a grave, speak about the death of Fatima Begam, wife of Hadrat Dagh Dehlawi, in AH 1316 (AD 1898-99). The composer of the texts, Dagh Dehlawi has been an eminent Urdu poet who expired in the first decade of the present century.

2. ASAF JAHI INSCRIPTIONS, HYDERABAD, DISTRICT HYDERABAD.— This elegant Persian epigraph, executed in Nastaliq characters, mentions the death of Qutb-i-Zaman Shah Muinu'd Din *alias* Shah Khamush, in AH 1288 (AD 1871-72) and records that the tomb of the saint was constructed by the Minister Nawwab Asmanjah Bahadur, during the reign of Nawwab Mjr Mahbub Ali Khan Bahadur, the king of Deccan (AD 1869-1911).

Belonging to the time of the same Asaf Jahi ruler Mir Mahbub Ali Khan, is another bilingual inscription (Perso-Urdu) that records the erection of Nabi Khana-i-Muhammad (probably the *Sama Khana,* i.e., audience hall) in front of (the tomb of) Hadrat Khamush in AH 1306 (AD 1888-89), during the Prime Ministership *(Madaru* 7 *Mahami)* of Nawwab Asman Jah Bahadur, who is referred to above. It further adds that this work was carried out with great efforts of Salu Begam Sahiba, the spouse of the deceased (Nawwab) and under the supervision of Sayyid Muhammad Asghar Husaini, the *Sajjada,* i.e., the spiritual successor.

Another Perso-Urdu inscription assigns the construction of a gate, termed as *Bab-i- Farid* (in the tomb of Shah Khamush), to Muhammad Shah Sabir, during the rule of Mir Mahbub Ali Khan in AH 1307 (AD 1889-90), under the supervision of Sayyid Muhammad Asghar Husaini, referred to above.

The next metrical epigraph in Persian is from the grave of the renowned Urdu poet Dagh Dehlawi, at Dargah Yusufain in Hyderabad. Beautifully composed by the poet Sa'il, the text speaks highly of Dagh Dehlawi as a poet, entitled Fasihu'l Mulk and Jami-i-Hind. It further records that the deceased was the literary guide *(ustad)* of the then Nizam (i.e., Mahbub Ali Khan Asaf Jah VI) who expired in the evening of Hajj day in AH 1322 (14th February, AD 1905) and was buried the next day.

GUJARAT

3. EPITAPHS FROM AHMEDABAD, DISTRICT AHMEDABAD.— A good number of epitaphic records have been copied from different graveyards at Ahmedabad. Several Arabic epitaphs from a Bohra graveyard in Saraspur locality, provide names, dates of death and lineage of some of the leading personages including both men and women. Among the deceased are : versatile scholar Sayyidna Maulana Badru'd Din Hasan, son of Wali (AH 1090/AD 1679); Shaikh Miyan Hasan Bha'i, son of Taj Khan, son of Hasan (AH 1093/AD 1682); Makhtum Sadaf Bu, daughter of Yaqub Khan (AH 1106/AD 1695);Ajbu, daughter of Shaikh al-Masha'ikhMullaAbdu'rRahim (AH 1131/AD 1718); Harji Bu, daughter of Sayyidna Diyau'd Din Dai, i.e., a preacher from Yemen (AH 1140/AD 1727-28); Shaikh Da'ud son of Kabir Muhammad (AH 1140/AD 1727), and Moti Ba'i, daughter of Bha'i Ji and wife of Miyan Firuz Bha'i, son of Qutb Bha'i (AH 1206/AD 1791-92).

KARNATAKA

4. MISCELLANEOUS INSCRIPTIONS, BANGALORE, DISTRICT BANGALORE.— This metrical Persian inscription, composed by Kaifi, eulogizes the tomb of Tawakkal Mastan and registers its construction, through a chronogram, yielding AH 1191 (AD 1777-78) but without giving the name of the builder. While a Persian record from Jami Masjid Lashkar, referred to in the epigraph as *Masjid-i-Jami Jaish,* contains metrical text by three different poets *viz.,* Munshi Shah Muhammad Jalal Qadiri nom de plume Wafa, Munshi Kazim Ali Kazim and Sayyid Hasan, pen-named Rafiq, assigning the construction of the said mosque to the army personnel of Bangalore, in AH 1244 (AD 1828-29). Another metrical inscription in Persian from the mosque called Beopariyon-ki-Masjid, records its construction in AH 1245 (AD 1829-30) without specifying the name of its builder. One Sarush was the composer of the text.

5. MISCELLANEOUS INSCRIPTION, BELLUR, DISTRICT MANDYA.— Couched in Persian verse in Nastaliq hands, is a brief record that assigns the construction of a mosque to one Ibrahim (son of > Hisbatu'llah, in AH 1252 (AD 1836-37).

6. MISCELLANEOUS INSCRIPTION, (KIRANGUR) SRIRANGAPATNA, DISTRICT MANDYA.— This bilingual inscription (English and Persian) over a pillar of an old bridge on the river Kaveri, records the completion of the bridge after the name of Marqs Wellesley Bahadur, referred to in the Persian text as *Jisr-i-Wellesley* (i.e., Wellesley Bridge as recorded in the English version), at the order of *Raja-i-Mysore* (Krishna Wodeyar Bahadur) under the supervision of Purnaiya, the Diwan, in AD 1804. The English version, which is not the exact translation of the Persian text, provides some additional pieces of information, which specifically mentions both the dates, August AD 1802 when the construction work started and October AD 1804, when the construction work was completed. Thus, this historically important inscription is indicative of the fact that the political relations between Marqs Wellesley, the Governor General of India (AD 1798 - 1805) and the Wodeyar ruler of Mysore were extremely cordial.

7. MISCELLANEOUS INSCRIPTIONS, MYSORE, DISTRICT MYSORE.— A brief Persian inscription from a local mosque, assigns the construction of the mosque to one Ismail by name in AH 1249 (AD 1833-34). The text was composed by Ghulam Gilani and was inscribed by Sayyid Mahmud.

Of the two epitaphic records in metrical Persian, one from the tomb of Bandagi Shah records the death of the pious and accomplished saint in AH 1253 (AD 1837-38), whereas the other from a local graveyard registers the death of Badr Zaman Khan son of Mahkari Musa Rida in AH 1277(AD 1860-61). One Dhauqi was the composer of the text.

MADHYA PRADESH

8. INSCRIPTION OF NAWWABS OF BHOPAL, DISTRICT BHOPAL.— This brief Persian record from the local graveyard registers the name of Nawwab Wazir Khan, the sixth Nawwab of Bhopal and specifies his ruling time between AH 1224 (AD 1809-10) and AH 1232 (AD 1816-17). One Samiu'd Din was the inscriber of the text.

9. FARUQI INSCRIPTION, ASIRGARH, DISTRICT EAST NIMAR.— This Persian inscription on a gun records that this gun was manufactured in the fort (of Asirgarh) during the month of Muharram AH 961 (December AD 1553 - January AD 1554) at the order of Mubarak Shah, son of Adil Shah Faruqi. The name of the Faruqi ruler with a rare epithet, is given as *Hadrat Saltanat Shuari Mubarak Shah ibn Adil Shah Faruqi.*

10. EPITAPH FROM REWA, DISTRICT REWA.— This metrical Persian record mentions the death of a learned and saintly personality Maulawi Aman Ali in AH 1277 (AD 1860). It also records that the deceased was a poet and renowned figure of his time. The composer of the text was Thaqalain and the inscriber, Ali Khan.

11. MUGHAL INSCRIPTIONS, SHUJALPUR, DISTRICT SHAJAPUR.— This damaged inscription in Persian from a grave, records the fact that the tomb-stone of the grave of Chaudhari Muhammad Yadgar was installed during the reign of Shah-i-Alam Bahadur Badshah Ghazi in the first regnal year, corresponding to AH 1119 (AD 1707-08). Probably, Shah Ahsan was the person under whose supervision this work was carried out.

The other Mughal inscription from a step-well belongs to the time of Muhammad Shah, saying that one Mirza Rustam, for his merit in the next world, constructed the step-well in the fourteenth regnal year of the above mentioned king, corresponding to AH 1145 (AD 1732). This important inscription also records the name of the mason as Hari Ram.

12. MISCELLANEOUS INSCRIPTION, SHUJALPUR, DISTRICT SHAJAPUR.— This Persian epitaph executed in beautiful Nastaliq characters, records the death of Qadi Sayyid Ghulam Mustafa, in AH 1252/Fasli 1245 (AD 1836). Sayyid Saadat Ali was the calligrapher of the text.

MAHARASHTRA

13. MISCELLANEOUS INSCRIPTION, PATUR, DISTRICT AKOLA.— This historically important epigraph in Persian verse was copied from a gate at the Dargah of Shaikh Babu, saying that this structure, obviously the gate whereupon it is fixed, was founded in AH 1015 (AD 1606-07) during the time of Khan-i-Khanan son of Bairam Khan, who was by the grace of (Allah) a successful and dignified (Deccan) Governor, bestowing favours at the threshold of (the saint Shaikh Babu). This inscription is published without plate but its reading is faulty (Cf. *Epigraphia Indo-Moslemica, 1907-08,* p.19, *Tadhkira-i-Auliya-i- Dakan,* p.529).

14. BAHMANI INSCRIPTION, ACHALPUR, DISTRICT AMRAVATI.— This Persian inscription, not *in situ,* was copied from Jiwanpura Gate of the town. It relates to the erection of new mosque in the region of Ellichpur by Malik...Atiq Husain Shah Balkhi (at the order of) Masnad-i-Ali... Ulugh-i-Azam during the time of Alau'd-Dunya wa'd Din Ahmad Shah, son of Ahmad Shah as Sultan (AD 1435-57).

15. INSCRIPTION OF NAWWABS OF ACHALPUR, DISTRICT AMRAVATI.— This epitaphic Persian record mentions the martyrdom of Nawwab Muhammad Ismail Khan Bahadur, son of Muhammad Sultan Khan Bahadur Panni Afghan Sulaiman Zai Mahdawi, the servant of Nizamul Mulk Asaf Jan, in AH 1189 (AD 1775-76).

16. ASAF JAHI INSCRIPTION, ACHALPUR, DISTRICT AMRAVATI.— This metrical Persian record, executed in Nastaliq characters, was copied from the local Idgah, purporting that the magnificent Idgah was repaired with the full co-operation of the Muslims, at the instance of the just and wise minister Mukhtar Mulk (MirTurab Ali Khan Mukhtarul Mulk Salar Jang), during the just auspicious reign of Mahbub Ali Khan, the Deccan ruler, in AH 1299 (AD 1881-82). It also records the name Muhammad Abd Bari who took keen interest in this work, being helped by a religious person like Khwaja Bahau'd Din. The composer of the text was Amjad (Amjad Husain Khatib).

17. MISCELLANEOUS INSCRIPTION, NIZAMPUR, DISTRICT AMRAVATI.— This Persian record assigns the construction of a grand and auspicious Idgah to Jumdatut Daula, under the supervision of Muhammad Azizu'd Din Khan, in AH 1265 (AD 1848-49). A poet pen-named Ashiq was the composer of the metrical part who brought out the chronogram in a hemistich, *Idgah-i-Khujista Bunyad,* i.e., an Idgah of auspicious foundation, yielding the above date.

18. MUGHAL INSCRIPTION, AURANGABAD, DISTRICT AURANGABAD.— This inlaid Persian inscription in beautiful Nastaliq characters, from a mosque in Mahalla Anguri Bagh records eulogical verses about Mughal emperor Shah Muhyiu'd-Din Muhammad Alamgir, i.e., Aurangzeb, during whose reign, the humble servant Daulat by name built a mosque, referred to as *Masjidal-Aqsa,* in AH 1096 (AD 1684-85). This inscription is noticed elsewhere with several mistakes in its reading and the date (Cf. *Waqiat-i-Mamlakat-i-Bijapur,* pt.UI (1915), p.58).

UTTAR PRADESH

19. INSCRIPTION, KARA, DISTRICT ALLAHABAD.— A loose fragmentary record in Persian in Naskh style was found in a local mosque called Chhoti Masjid in Mahalla Kara Bazar (pl.XL A). The extant portion records the name Sultan Muhammad Tughlaq (AD 1325-51) regarding some construction, probably the mosque where the fragmentary piece is lying. Unfortunately, other details of this inscription are lost.

20. LATE MUGHAL INSCRIPTION, KARA, DISTRICT ALLAHABAD.— This important later Mughal Persian inscription (pl.XL B) from a well mentions the foundation of Ganga Bagh and a well at the hands of Ra'i Uncha Lai and Lala Bhawani Prasad, the *Qanungus* of *Sarkar* Kora and Kara, with the grace of Shani Maharaj (lord Shani, i.e., planet Saturn), in the twenty-fifth regnal year of Muhammad Shah, corresponding to AH 1156 (as the chronogram actually yields), the Christian equivalent being AD 1743.

21. PERSIAN EPIGRAPH, KARA, DISTRICT ALLAHABAD.— A brief Persian epigraph from a well in Kali Mahal near the Bagh of one Asadu'llah, records the excavation of a well by Nilkant, son of Harbans Das Kaist (i.e., Kayastha) in AH 1059 (AD 1649).

22. INSCRIPTION OFNAWWABS OF AWADH, KANPUR, DISTRICT KANPUR.— This metrical Persian record, not *in situ,* was copied from a local graveyard, registering the event that Muhammad Bakhsh constructed a *sara* (inn) in AH 1236 (AD 1820-21) during the reign of Shah-i-Zaman Sultan-i-Din Parwar (epithets used for the then Nawwab of Awadh, Ghaziu'd Din Haidar, AD 1814-27).

23. MISCELLANEOUS INSCRIPTION, KANPUR, DISTRICT KANPUR.— This Persian epigraph belongs to a local mosque called Kotha Wali Masjid in Nawabganj, assigning the erection of the mosque to a religious person named Shaikh Khairat Ali, in AH 1244 (AD 1828-29). The next Persian record is an epitaph from Imam Bara Agha Mir, belonging to the grave of the eminent personality Nawwab Mutamidu'd Daula Mukhtaru'l Mulk Sayyid Muhammad Khan Bahadur Daigham Jang *alias* Agha Mir Sahib, the Prime Minister (the kingdom) of Awadh, who breathed his last in AH 1247 (AD 1832). Nasikh Lakhnawi was the composer of the epigraphical text.

The third Persian inscription was copied from the tank in Company Bagh in Nawabganj, registering a philanthropic enterprise during the famine days in the region. This valuable record narrates that in order to afford employment to the famishing poor, the construction work of this tank commenced with the voluntary contributions of the civilians and the natives of Kanpur. It further says that this work was completed with the liberal contribution of the British Government (Company Bahadur) and the total expense for this tank was 12,000 rupees. It also adds that the flights of steps (of the tank) on the four directions have been constructed with the specific resources of Shaikh Karam Ali. It concludes with the note that this beneficial public construction was carried out during the time and superintendence of Wiison Sahib Bahadur, the Magistrate, in the drought year AD 1838, corresponding to AH 1254/Fasli 1245.

24. MISCELLANEOUS INSCRIPTIONS, LUCKNOW, DISTRICT LUCKNOW.— This metrical Persian record from the mosque in the enclosure of the Dargah Shah Abdu'r Rahman assigns the construction of the mosque to one Badr-i-Kaukab by name, in AH 1187 (AD 1773-74).

Among the three Persian records copied from three different *ghats* of Tikait Rai *Talab,* the first one records the renovation, obviously of the tank, by Puranand with the patronage and at the instance of Raja Tikait Ra'i in AH 1199 (AD 1784-85). Of the same purport is the second brief metrical inscription comprising a Persian couplet only. In the first hemistich, it hints at calculating the Samvat date *(biya mutabiq-i-tarikh-i-hind harfara* 7) according to the chronogram given in the second hemistich, yielding 1842 (AD 1785). While the third slab records only three chronograms, one in Arabic and two in Persian, giving the Hijri date 1199 (AD 1784-85).

25. INSCRIPTION OF NAWWABS OF AWADH, LUCKNOW, DISTRICT LUCKNOW.— This Persian record comes from Karbala Talkatora that assigns the auspicious construction of, obviously the Karbala, referred to as *Maqtal-i-Athar Husain Shahid,* to KhudaBakhsh in AH 1232 (AD 1816-17) during the time of Ghaziu'd Din Haidar Asaf Jah. It also mentions the names Rif' atu'd Daula and Ali Khan for their assistance and generosity in the building of the said structure.

III. NUMISMATICS AND TREASURE TROVE[1]

KARNATAKA

1. ORNAMENTS AND SILVER COINS, DISTRICT BELLARY.— Seven ornaments and one hundred and forty-four punch-marked silver coins were received as treasure trove.

2. GOLD AND SILVER COINS, DISTRICT CHITRADURGA.— Thirty-nine gold coins were received as treasure trove from District Chitradurga. Out of these one is gold *varaha* of Tipu Sultan, another is gold *varaha* of Sri Krishnaraja and thirty-seven *aiephanams* of Mysore Wodeyars. One hundred and eight silver coins of East India Company were also acquired.

3. GOLD COINS, DISTRICT MYSORE.— Two hundred and eighty-three gold coins were received as treasure trove. Out of these one is *varaha* of Krishnaraja, one hundred and thirty-one are *phanams* of Sri Kantiraya and one hundred and fifty-one are *phanams* of Tipu Sultan.

MAHARASHTRA

4. COPPER COINS, PIMPALGAON, DISTRICT WARDHA.— The epigraphy Branch, Nagpur, of the Survey, acquired through Pulgaon Police Station six hundred and thirty copper coins found at Pimpalgaon. These coins represent different dynasties and kings. Only one coin belongs to Shamsud-Din Muhammad Shah III (AD 1463-82) of Bahmani dynasty. Mughal dynasty is. represented by two hundred and sixty-two coins, comprising thirty-two of emperor Aurangzeb; one of Shah Alam I; seventeen of Muhammad Shah; five of Ahmad Shah; two of Alamgir II and two hundred and five of Shah Alam II. These Mughal coins belong to Ellichpur and Cuttack mints. A local dynasty, the Nawwabs of Ellichpur is represented by two coins of Namdar Khan Panni (AD 1825-45). Rest of the copper coins are the issues of the Maratha chiefs in the name of the Mughal kings of Delhi (pl.XLI).

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[1]Information from: 1-3, The Directorate of Archaeology and Museums, Government of Karnataka; and 4, M.I. Quddusi of the Epigraphy Branch of the Survey, Nagpur.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. ANCIENT TEMPLES, DISTRICT CUDDAPAH.— During the course of village-to-village survey the Directorate of Archaeology and Museums, Government of Andhra Pradesh, located the temples at Pandalamarri and Chinta Komma Dinne, belonging to Vijayanagara and post-Vijayanagara periods.

2. COINS AND LOOSE SCULPTURES, AMARAVATI, DISTRICT GUNTUR.— M. Umamaheswara Rao of the Hyderabad Circle of the Survey, noticed during the clearance work around Maha-stupa, two potin coins, one belonging to Gautamiputra Yajna Sri Satakarni (AD 165-195) and the other rusted, perhaps belonging to the Satavahana period and fragments of *chhatri,* pillars, *suchis* and mutilated face of Bodhisattva (?), fragmentary coping stone (?) with inscription in Brahmi reading *karitho* datable to first and second century AD.

3. MEMORIAL PILLAR, DHARANIKOTA, DISTRICT GUNTUR.— M. Umamaheswara Rao of the Hyderabad Circle of the Survey, discovered a fragment of a memorial pillar of Satavahana period with two line Brahmi inscription reading *Aksha sa putasa ca cadu magna sacacha ya tha.*

4. LIMESTONE COPINGS, JUJJURU, DISTRICT KRISHNA.— J. Vara Prasada Rao and R. Krishnaiah of the Hyderabad Circle of the Survey, noticed limestone copings and fragments *of chhatri* of a stupa with beautiful friezes of animals and floral motifs, datable to *circa* second century BC. Besides a medieval stone image of Ganesa, a lead coin ascribable to Sada kings, loose sculptures of Bhairava, Brahma, *nandi* and hero-stone datable to late medieval period were also discovered.

5. LIMESTONE PILLARS, PUSHADAM, DISTRICT KRISHNA.— J. Vara Prasada Rao and R. Krishnaiah of the Hyderabad Circle of the Survey, noticed limestone pillars of a *mandapa* with carvings of bust of a couple and lotus medallions at Pushadam near Ghantasala.

6. INSCRIPTIONS, DISTRICTS ANANTAPUR, KAKINADA, KURNOOL, MEDAK, NALGONDA, TIRUPATI, VISHAKHAPATNAM AND WARANGAL.— The Directorate of Archaeology and Museums, Government of Andhra Pradesh, during the course of epigraphical survey, traced several inscriptions belonging to the Western Chalukyas, Kalyani Chalukyas and Vrjaynagara kings from the different sites of the above districts.

HARYANA

7. ANCIENT REMAINS, DISTRICT AMBALA.— D.K. Handa and Ashvini Agrawal of the Department of Ancient Indian History, Culture and Archaeology, Punjab University, Chandigarh, along with a team of research students, noticed the remains of an early medieval Siva temple of ninth-tenth century including a very large number of sculptures and architectural members at Morni-Ka-Tal, about 10 km down the hill from Morni village. A few short inscriptions in Sarada script of the

same period were found fixed in the walls of a modern temple at the site. Pottery of the Gurjara-Pratihara period and a few potsherds of Kushan period were also picked up from the site.

PUNJAB

8. POTTERY, BRICKS AND TERRACOTTA FIGURINES, DISTRICT NAWANSHAHR.— D.K. Handa and Ashwini Agrawal of the Department of Ancient Indian History, Culture and Archaeology, Punjab University, Chandigarh, reported the discovery of Kushan pottery, bricks and figurines of terracotta besides medieval remains from Gunachaur and Hima.

TAMIL NADU

9. ANCIENT REMAINS, DISTRICT DHARMAPURI.— K.V. Raman of the Department of Ancient Indian History, Culture and Archaeology, University of Madras, during the course of exploration noticed a fort belonging to Nayaka period at Thenkaraikottai in Harur taluk. Also reported were the two Siva temples, a Vishnu temple, *Ranimandapa* and a granary. The fort area yielded a few sherds of coarse red ware, porcelain and glass ware besides terracotta smoking pipes.

10. INSCRIPTION, TEMPLE, DISTRICT TIRUVANNAMALAI SAMBUVARAYAR.— In continuation of the previous year's work in Polur taluk *(1993-94,* p. 98), the neighbouring villages of Padavedu *viz.,* Pallankollai, Thuvaranthal, Thangal, Natchatrakunru, Anandapuram and Sambuvarayanallur were explored by the Department of Ancient Indian History, Culture and Archaeology, University of Madras, under K.V Raman. At Pallankollai, a hero-stone with the depiction of a man shooting an arrow was noticed on the road between Pallankollai and Kalasamudram. Besides, on a stone-slab in a paddy field at Thuvaranthal were noticed an uncopied thirty-seven lined inscription in the Tamil language and script of sixteenth century. Also traced was a fourteen-lined inscription of the fourteenth century at Natchatrakunru.

At Anandapuram, a dilapidated apsidal temple belonging to the twelfth-thirteenth century was uncovered upto the basement level; also noticed were a number of uncopied Tamil inscriptions. In these records the presiding deity of the temple is mentioned as Kailaigirinathar.

V. RADIOCARBON DATES[1]

Radiocarbon dates presented here were determined at the Physical Research Laboratory, Ahmedabad. The dates[2] are in BP scale; and for their conversion into BC/AD scale, the year 1950 is to be taken as the base. All the dates are based on half-life value of 5730 ± 40 years; and they are not corrected for $^{14}C/^{12}C$ variation.

DELHI

1. LAL KOT, DISTRICT SOUTH DELHI

PRL-1664. Red ware — 1080 ± 100
Charcoal from Trench C7, Qd 1
Layer PIT-4 sealed by 11, Depth 4.1 m
Sender's Sample No. LKT-3/92.

KARNATAKA

2. BANAHALLI, DISTRICT KOLAR

i. PRL-1674. Neolithic — 3540 ± 60
Charcoal from Trench XA 1, Qd 1&2
Layer 20, Depth 4.80 m Sender's
Sample No. BNH/CS/1

ii. PRL-1675. Neolithic — 3890 ± 70
Charcoal from Trench XA Qd 1
Layer 16, Depth 5.15 m Sender's
Sample No. BNH/CS/2

MAHARASHTRA

3. ADAM, DISTRICT NAGPUR

i. PRL-1667. Historical — 1740 ± 60
Charcoal from Trench G 18/2, Layer 6,
Locus G18/Qd 2 Depth 2.6 m Sender's
Sample No. CS/ADM-1-91-92/2

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[1] Contributed by Sheela Kusumgar and M.G. Yadava of the Physical Research Laboratory, Navrangpura, Ahmedabad 380009. Further details can be obtained from the excavators.

[2] Samples submitted by : 1, Delhi Circle, New Delhi; 2, Madras Circle, Madras; and 3, Excavation Branch I, Nagpur, of the Survey; 4-5, Deccan College, Pune; and 6, Physical Research Laboratory, Ahmedabad.

ii. PRL-1666.Megalithic — 2710 ±110
Charcoal from Trench TS/4 Layer 15, Locus T5 Qd 4 Depth 4.95 m Sender's Sample No. CS/ADM-1-91-92/3

iii. PRL-1668.Megalithic — 2010 + 60
Charcoal from G19 Qd 3, Layer 13, Locus G19 Qd 3 Depth 6.3 m Sender's Sample No. CS/ADM-1-91-92/5

iv. PRL-1669. Historical — 2600 ±150
Charcoal from Trench F16 Qd 2, Layer 5, Locus F16 Qd 2 Depth 1.7 m Sender's Sample No. CS/ADM-1-91-92/1

v. PRL-1670. Megalithic — 2390 ± 60
Charcoal from T5 Qd 1, Layer 11 Locus T5 Qd 1, Depth 3.8 m Sender's Sample No. CS/ADM-1-91-92/6

vi. PRL-1671. Megalithic — 2410 ± 70
Charcoal from G19 Qd 3, Layer 12 Locus G19 Qd 3, Depth 6.2 m Sender's Sample No. CS/ADM-1-91-92/7

vii. PRL-1672. Historical (Mauryan) — 2650 ± 70
Charcoal from H 18 Qd 4, Layer 6 Locus H 18 Qd 4, Depth 2.6 m Sender's Sample No. CS/ADM-1-91-92/8

viii. PRL-1673.Chalcolithic — 2380 + 70
Charcoal from T5 Qd 4, Layer 16 Locus T5 Qd 4, Depth 5.4 m Sender's Sample No. CS/ADM-1-91-92/4

RAJASTHAN

4. BALATHAL, DISTRICT UDAIPUR

i. PRL-1834. Chalcolithic — 4350 + 70
Charcoal from Trench OD, Layer 10 Locus SW, Depth 4.0 m Sender's Sample No. 03

ii.	PRL-1835. Historical Charcoal from Trench F4, Layer 7 Locus NE, Depth 3.17 m Sender's Sample No. 04	3830 ± 60
iii.	PRL-1841. Historical Charcoal from Trench HX2, Layer 3 Locus SE, Depth 0.83 m Sender's Sample No. 10	2110 ±60
iv.	PRL-l843.Chalcolithic Charcoal from Trench HX2, Layer 11 Locus SW, Depth 2.83 m Sender's Sample No. 12	4120 ± 70
v.	PRL-1844.Chalcolithic Charcoal from Trench HX2, Layer 12 Locus SW, Depth 3.27 m Sender's Sample No. 13	4300 ± 80
vi.	PRL-1846.Chalcolithic Charcoal from Trench HX2, Layer 14 Locus NW, Depth 3.16 m Sender's Sample No. 15	4310 ±80
vii.	PRL-1849. Early Medieval Charcoal from Trench C, Layer 3 Locus SW, Depth 0.9 m Sender's Sample No. 18	2290 ± 70
viii.	PRL-1850. Early Medieval Charcoal from Trench Cl, Layer 2 Locus SE, Depth 0.47 m Sender's Sample No. 19	3530 ± 70
ix.	PRL-1851. Historical Charcoal from Trench B, Layer 4 Locus NW, Depth 1.4 m Sender's Sample No. 20	3510 ±70
x.	PRL-1848. Historical Charcoal from Trench C, Layer 2 Locus SW, Depth 0.5 m Sender's Sample No. 17	1820 + 70

xi. PRL-1930. Chalcolithic — 3760 ±110
Charcoal from Trench OE, Layer 21
Locus SW, Depth 4.71 m Sender's
Sample No. 07

xii. PRL-1932. Chalcolithic — 4080 ±110
Charcoal from Trench OE, Layer 22
Locus SW, Depth 4.84 m Sender's
Sample No. 09

TAMIL NADU

5. VEERAPATTI, DISTRICT MADURAI

i. PRL-1801.Megalithic — Modern
Charcoal from Trench I
Locus 002, Depth 0.1 m
Sender's Sample No. 9

ii. PRL-1800.Mesolithic — Modern
Charcoal from Trench II
Locus 003, Depth 0.15 m
Sender's Sample No. 10

UTTAR PRADESH

6. CHAUSALI, DISTRICT PITHORAGARH

PRL-1652. Historical — 1760 ± 100
Charcoal from terrace type field No.4
Sender's Sample No. 69

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The present report incorporates the work done at Birbal Sahni Institute of Palaeobotany, Lucknow, on the botanical remains recovered from the excavations at Banawali in Haryana, Sanghol in Punjab and Lumbini in Nepal.

HARYANA

1. BANAWALI, DISTRICT HISSAR.— The agricultural economy has been built up by studying the remains of carbonized grains and seeds from the pre-Harappan culture *(circa* 2750-2500 BCJ and the succeeding phase of Mature Harappan culture *(circa* 2500-2000 BCj. The finds from pre-Harappan levels include cereals, millets, legumes and oil-seeds belonging to hulled-barley *(hordeum vulgare),* naked-barley (h. *vulgare* var. *nudum),* emmer-wheat *(triticum dicoccum),* dwarf-wheat *(t. sphaerococcum),* bread-wheat *(t. aestivum),* club-wheat *(t. compaction), jowar-millet (sorghum bicolor),* horse-gram *(dolichos biflorus),* field-pea *(pisum arvense),* lentil *(lens culinaris),* chick-pea *(cicer arietinum),* grass-pea *(lathyrus sativus), til (sesamum indicum)* and field-brassica *(brassica juncea).* The wild and weed remains, appeared as an incidental mixture with the crop remains, include the seeds of *trianthema triquetra* and *tamarindus indica* (tamarind), grains of *setaria* sp. and stone-piece of ziziphus *nummularia* (jharberi).

From the succeeding mature Harappan levels the remains of hulled and naked barley, dwarf-wheat, bread-wheat, club-wheat, *jowar-millet,* horse-gram, field-pea, chick-pea and *til* are of the same kinds as from pre-Harappan levels. However, rice *(oryza sativa),* green-gram *(vigna radiata),* fenugreek *(trigonellafoenum-graecum)* and cotton-seed *(gossypium arboreum/herbaceum)* are new finds. Besides, pod-piece of *shikakai (acacia rugata* and date-stone *(phoenix* sp.) are also interesting finds. Weeds and other wild taxa represented by the seed and fruit remains, include *trianthema triquetra, ziziphus nummularia, vetivaria zizanioides, solarium* cf . *suratense* and species of *ipomoea, dactyloctenium* and *vicia.*

PUNJAB

2. SANGHOL, DISTRICT FATEHGARH SAHIB.— Large quantities of botanical material collected from inside the fire-altars of Kushan period (AD 100-300), undisputably came from oblations offered in fire-sacrifice. The study of botanical remains (pls.XLII-XLV) in the altars has provided an insight for the first time in archaeological context, for confirmation or otherwise of the statements made in the religious texts. Different types of botanical remains fall under four broad categories as under:

A. FOOD GRAINS.— Mixture of seven types of food grains includes rice *(oryza sativa),* barley *(hordeum vulgare),* wheat *(triticum aestivum), mung* or green-gram *(vigna radiata), urad* or black-

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[1]Contributed by K.S. Saraswat, Chanchala Srivastava and Anil Kumar Singh Pokharia of the Birbal Sahni Institute of Palaeobotany, 53, University Road, Lucknow-226007

gram *(vigna mungo),* lentil *(lens culinaris)* and *til* or sesame *(sesamum indicum)* (pis. XLII-XLIIIA). A few seeds of horse-gram or kulthi *(dolichos biflorus)* and grass-pea *(lathy rus sativus)* also turn up, possibly as contamination in the desired food grains.

B. EDIBLE FRUITS.— Nine fruits are represented by the remains of wild jujube *(ziziphus nummularia),* cultivated jujube *(ziziphus mauritiana)* (pl.XLIII J and K), date *(phoenix* sp.) (pl.XLIVC), almond *(prunus amygdalus),* walnut or *akhrot (juglans regia)* (pl.XLIII M and E), grape/raisin *(vitis vinifera)* (pl.XLIVA), *chilgoza (pinus gerardiana),* pistachio-nut *(pistacia* cf. *vera)* and gular-fig *(ficus glomerata)* (pl.XLIII F, G, B).

C. MEDICINAL FRUITS AND SEEDS.— Represented by the remains of emblic-myrabolan or *anwla (emblica ojficinalis)* (pl.XLIII D), chebulic-myrabolan or *harra (terminalia chebula)* (pl.XLIII H), nutmeg or *jaiphal (myristica fragrans)* (pl.XLIII C), *khanda/phok (ephedra* sp.) (pl.XLIV D), black-pepper *(piper nigrum)* and basil or *tulsi (ocimum* cf. *sanctum)* (pi. XLHII and L).

D. WOOD CHARCOALS.— Woods used to lit fire, vernacularly known as *'samidhd"* in the religious scriptures, are represented by the charcoals of *pipal (ficus religiosa), gular (ficus glomerata), palash (butea monosperma)* (pl.XLIV F, G, H), *deodar (cedrus deodara), tamal* or camphor type *(cinnamomum* sp.), kaith *(feronia limonia)* and sandalwood *(santalum album)* (pl.XLV). These quality woods are specifically prescribed in a number of religious books and are still used in traditional fire-sacrificial rituals.

The substances partaking in the fire-sacrifice are so varying, their chemical nature so different and the conditions under which combustion takes place are so unspecified that it is difficult to interpret the process on exactly scientific basis. Substances with healthy constituents, sweet in nature, having fine aromatic smell and medicinally important constituents — used collectively, will pose considerable difficulty for a chemist to give satisfying analysis. According to older view, the substances are reduced to finer state under the action of fire and thereby, if inhaled along with air, they would be more efficacious than what would have been, if consumed in gross form. And therefore, in the choice of their selection the ancients sorted out the material of quality.

SAMPLES FROM ABROAD

NEPAL

3. LUMBINI, DISTRICT TAULIHAWA.— The wood charcoal samples collected from different horizons of the deposits of NBPW level *(circa* 600-200 BC), have been sectioned and studied on anatomical grounds, to determine their specific identification. The taxa identified belong to the tropical deciduous *sal* forest. The chief components of the forest vegetation belong to *shorea robusta, terminalia tomentosa, adina cordifolia, gardenia turgida* and *dalbergia* sp.Quite a few taxa have tentatively been identified as belonging to anacardiaceae, mimosacea, apocynaceae, magnoliaceae, meliaceae and bombacaceae. *Shorea robusta* charcoals, being predominantly present in the samples, indicate the selective exploitation of this quality timber.

VII. MUSEUMS

1. TAJ MUSEUM, AGRA.— During the year under review, some of the paintings in the museum collection were mounted.

2. GOVERNMENT MUSEUM, AJMER.— During the period under review the museum acquired thirteen silver (alloy) coins of Chauhan king Ajay Deo, found from the village Loharwara through the Sub-Divisional Magistrate, Ajmer. The museum also acquired hundred and four Indo-Sassanian copper coins from the village Atitmand. These coins were also chemically cleaned.

The museum also acquired eleven sculptures in blackstone, ranging in date between eleventh and twelfth century AD through the President, Sri Adinatha Digambara Jaina temple, Sarwar. These include seven images of Tirthankara (55x50 cm; 45x30 cm; 50x45 cm; 40x30 cm; 12x8 cm; 25x13 cm and 14x13 cm); Parsvanatha (45x45 cm; 22x15 cm); *parikara* piece (40x40 cm) and Mahishasuramardini (30x30 cm).

Besides, the museum also attended to the work of providing wooden pedestals for display of sculptures; wooden frames and varnish for the inscriptions; two big iron windows for newly constructed booking and reception rooms; a big size publicity board at the main entrance of the museums. The exhibits were also duly classified and cleaned. Arrangements were made to provide safety and sufficient lights in the galleries.

3. ALLAHABAD MUSEUM, ALLAHABAD.— The museum acquired through purchase seventeen prehistoric objects; gold and copper coins five each, three silver coins; one terracotta sealing; two copper-plate inscriptions; seven metal objects; and two paper documents to enrich its collection. Most noteworthy collection comprises Kushan gold coin *(oesho* type); and three gold coins of Kirtivarman of Chandela dynasty besides two inscribed copper plates.

The museum organized three national level seminars on *Indian Cultural Heritage and Tibet* (28th January 1995), *Issues arising out of the third World Archaeological Congress* (20th March 1995) and *Ancient Indian Trade* (21-23 March 1995) and a seminar on *Allahabad Ke Vikas Ke Charan evam Tithikram* (19-20 November 1994) jointly with the project of History of Indian Science, Philosophy and Culture. A National seminar on *Rachana aur Alochana* (15-17 July 1994) was organized under the project of Literary and Cultural History of Allahabad. Besides, other important colloquiums on various aspects like historiography, literature and art were also conducted.

Various exhibitions arranged during the period under review are Drawings and Paintings of B.D. Pande (May 1994), Drawings and Paintings of Jagdish Gupta (July 1994), Drawings and Paintings of Bipin Kumar Agarwal (August 1994) and Paintings of Nicholas Roerich (December 1994).

Eighteen lectures by eminent scholars like Ram Swaroop Chaturvedi, A.K. Saran, Naresh Mehta, Mukund Lath, G.N. Pant, B.N.S. Yadava, S.P. Nagendra, Vidya Niwas Mishra and Harbans Mukhia, were arranged. Two workshops on paintings and two short-term courses on History of Art and Culture and Introduction to Archaeology were also conducted.

4. ARCHAEOLOGICAL MUSEUM, BODHGAYA.— One hexagonal stone railing-pillar depicting the figure of a *yakshi* (first century BC) was handed over to the Kunsthistoriches Museum, Vienna, Austria, for display in the exhibition entitled Buddha in India—Early Indian sculptures to be held at Vienna. Besides, the museum also maintained a garden.

5. ARCHAEOLOGICAL MUSEUM, CHANDERI.— Provision of false wall has been made in the galleries along with preparation of wooden pedestals and show-cases for display of sculptures. Collapsible shutter to doors and iron-grill to windows have been provided. The work of arranging electrical outfit in the galleries has also been made along with paintings and colour-washing of the galleries and the museum building.

6. MAHARAJADHIRAJA LAKSHMISHWAR SINGH MUSEUM, DARBHANGA.— The museum acquired ivory wood carvings during the year under review.

7. ASSAM STATE MUSEUM, GUWAHATI.—The museum has collected a good number of cultural objects of the Dewries, a major plain Tribe of Assam, for display in the Ethnographic Gallery.

The most important event of this year is the setting up of thirteen numbers of District and Sub-Divisional Museums. The State Government has already alloted land for this purpose.

The State Government also sanctioned the proposal of setting up a large-scale exhibition in a pavilion depicting the Kamakhya Devi temple complex.

Grants-in-aid to some old *satra* (a Vaishnavite religious institution), private museums and to a local archaeological society were also sanctioned by the State Government.

Three seminars on *Asomar Oitihasic Sampad Sangraha, Aru Sangrakshanar Samasya, Asomar Loka Sanskritir Adhar Swamp Purani Satra Samuhar Sangrakshan* and on *Asomar Oitijhya Mandita Than Samuhar Sangrakshan,* were held during the year under review.

8. ARCHAEOLOGICAL MUSEUM, GWALIOR.— Construction of stone-masonry shelves in the reserve collection rooms of the museum, has been made.

Galleries have been painted with acrylic emulsion. Construction of masonry pedestal for display of stone sculptures in the open ground has been made along with preparation of cement pedestal for display of heavy stone sculpture in museum verandah.

9. GOVERNMENT MUSEUM, JHANSI.— During the year under review the museum acquired eight terracotta figurines, sixty-eight coins each of copper and silver, seven miniature paintings, one manuscript and six miscellaneous art objects.

10. ARCHAEOLOGICAL MUSEUM, KALIBANGAN.—Preparation of false ceiling, wooden pelmets and track light has been made in Gallery nos. 1 and 2.

Photographs of Kalibangan excavations have been laminated.

11. ARCHAEOLOGICAL MUSEUM, KHAJURAHO.— Vinyl flooring has been provided to the Main Gallery, Miscellaneous Gallery and to the corridor of the museum. Some damaged wooden pedestals of the sculpture in the Jaina Gallery and Main Gallery have been re-veneered with ivory colour . laminated sheet. Masonry platform has been constructed in Jardine Museum for display of sculptures.

12. GOVERNMENT MUSEUM, MATHURA.— During the period under review, the museum acquired six stone sculptures, one bronze, seven paintings, six hundred and fifty-four silver and forty-three copper coins.

Among the stone sculptures, the headless image of Bodhisattva (pl.XLVI A) with broken arms is noteworthy. The image (54x61 cm), datable to AD 172, belonging to the time of Vasudeva, was presented by the District Magistrate, Mathura, Shri K.P. Singh. The deity is seated cross-legged in *dhyana-mudra.* Bodhisattva is adorned with a necklace, seven-stringed garland of pearl with a beautiful pendant and a *yajnopavita.* The well-decorated halo behind the head of Bodhisattva is badly damaged. The Brahmi inscription in two lines on the pedestal reads.

1. *sa 94 he I di 15 etasya purwayam bhagavato sakya munisya pratima pratishthapita bhikshunam nagamitrenam mata pitranam agraputra*

2. *sataye upajhachayuryanam agraputra sataye ....sarvasatvanam hita sukhaye bhavatu -*

In the year 94 (in the reckoning of the Kushan era of AD 78 which coincides with AD 172) first month of *hemanta,* on the fifteenth day, an image of god Sakyamuni was installed by *bhikshu* Nagamitra for the welfare of the eldest son of Acharya and for the happiness of all sentient beings.

13. HAZARDUARI PALACE MUSEUM, MURSHIDABAD, MURSHIDABAD.— The museum displayed two vintage cars after proper renovation.

Repairing of the damaged interior of the museum building has been done.

The western Drawing Room has been painted and colour-washed to make it ready for display.

Wooden railing and barriers were provided for display of objects in the entrance to the Armoury Gallery as well as in the hall of Royal exhibits.

Some of the portraits and paintings kept in the reserve collection have been cleaned.

14. CENTRAL MUSEUM, NAGPUR.—The museum received forty-nine copper coins (from Ami Police Station, District Yeotmal, for chemical treatment) from the Survey, Nagpur.

One painting of king George V in the museum collection, was chemically preserved. After chemical treatment of eleven paintings received from Rajbhavan, Nagpur, preservative coatings were applied.

15. ARCHAEOLOGICAL MUSEUM, PURANA QILA.— Apart from providing fittings for flood lights in Gallery 1 re-wiring has been done in Gallery nos. 1 and 2. In newly made show-cases lighting arrangements were also made.

16. ARCHAEOLOGICAL MUSEUM, RATNAGIRI.— Two Galleries *viz.,* 1 and 2 have been set up and fully organized during this period. The selected pieces have been displayed on pedestals and in brackets. Repairing of the damaged interior of the museum building has been doffe.

17. ARCHAEOLOGICAL MUSEUM, RED FORT.— In the museum railings were provided in front of the show-cases to ensure safety besides replacing the electrical wire.

18. INDIAN WAR MEMORIAL MUSEUM, RED FORT.— Vinyl flooring has been provided in the reception room. Proper write-ups and labels have also been provided to the museum exhibits.

19. ARCHAEOLOGICAL MUSEUM, ROPAR.— Preparation of wall show-cases has been done along with the fittings for copper wires in the galleries.

The museum galleries, office and the exterior have been re-painted.

20. ARCHAEOLOGICAL MUSEUM, SANCHI.— In Gallery 1 new pedestals have been prepared along with renovation of the old ones.

Labels on perspex sheet have been provided for the displayed antiquities.

21. ARCHAEOLOGICAL MUSEUM, SARNATH.— Gallery 2 in the museum has been re-organized with Brahmanical sculptures preserved in the museum and thrown open to the public on 5 September, 1994.

Six stone antiquities have been handed over on temporary loan to the Indian Council for Cultural Relations, New Delhi, for an exhibition entitled Ashoka, Gandhi and Nehru— The Healing Touch, held in Fuji Art Museum, Tokyo, Japan.

Six stone antiquities have been handed over to the Kunsthistorisches Museum, Vienna, Austria, on temporary loan, for the exhibition entitled Buddha in India—Early Indian sculptures, held in Vienna, Austria.

Vm. ARCHITECTURAL SURVEY

BUILDING SURVEY.— K.K. Ramamurthy of the Building Survey Project of the Survey, assisted by Daljit Singh, Kewal Singh, Sudhir Kumar, K.K. Verma and Hemachandran of the Department of Archaeology, Kerala, conducted the survey of domestic buildings in Kerala.

During the period under review, the following buildings in Thiruvananthapuram, Kerala, have been visited for preliminary documentation: the Napier Museum (pl.XLVI B), Kanakakunnu Palace, Victoria Jubilee Hall, Old Residency, houses of Thanjavur Amma, and Uloor Paramesvaran Punjapura and Manimalika Palaces.

During the period under review, the Agra Circle of the Survey, under P.B.S. Sengar, assisted by G.N. Srivastava, O.D. Shukla, R.K. Tiwari, C. Lai, R.S. Balodi and Prem Kumar, surveyed old temples, *samadhis,* secular buildings and *ghats* in order to define the cultural heritage of Vrindavan in District Mathura.

Among the sacred places of Vrindavan, Sevakunj is famous for its garden containing indigenous flora *viz., pilu, hinsa, tamal, kuril,* etc., associated with mythological tradition and maintained in its original environs. There is a temple at the southern end of the garden built of white marble which is said to be hundred and thirty years old. Near the entrance gate five small chambers were found in a cluster. Four of them with domed-roof and the remaining one contains palanquin-type roof. These are called *bhajana sthalis* of the eminent saints. However, it appears that these are the *samadhi-mzmondls,* of some eminent saints. The walls of these *samadhis* were constructed with brick-core and sandstone veneering while the domes were of brick-work with plastered surface. At the neck of the dome some faint traces of painting in crimson colour have also been noticed. These *samadhis* were highly inaccessible due to intricate embracing of roots and branches of bushes. However, one of the *samadhis* being little accessible was surveyed from inside and two inscriptions in Devanagari script and composed in the couplets of Brajabhasha were noticed.

sri radhavallabhi jayati, sri harivamsa chandro jayati,

neha bhare dou ladale alabele sukuvara, hari

sahachari to kunjamen nisadina karata vihara,

samvat 1846, miti asvin, 6 badi 13 trayodasi

sri radhavallabhi jayati, sri hita harivamsa jayati

jorihita harivamsa kivilasanarati raye pranj,

sri halaslala nita neha son sevata sevakunja,

rajata sevakunja nita dampati le halasa,

kosasa posat bhava pala suraja premprakasa,

samvat ashtadasa sana sattanave sundar madhava masa,

sukla paksh subha dasa miti somvara sukhras

The Sevakunj is associated with the Radhavallabhi school of Vaishnavism. It is said that Sri Hita Harivamsa (Vikrama Samvat 1559-1609), a pioneer of Radhavallabhi school at Vrindavan had established four important places of Vaishnava faith of which Sevakunj is one.

Radha Damodar Temple, trad·tionally believed to have been constructed by Sri Jeeva, is one among the many ancient temples of"" 7.indavan. He was the disciple of Sri Sanathan and Sri Roop his two uncles, the eminent sages of Chaitanya Panthi Gaudiya Vaishnava sect. A copy of the sale-deed (published by Vrindavan Research Institute) reveals that in AD 1558 Jeev Gushayi bought a plot of land from one Ali Shah Chaudhry, the boundaries correspond so far as can be determined with the site of Radha Damodar Temple. The temple, with a *deodhi-type* entrance gate, while the other gate facing the temple opens to the courtyard. The main shrine consists of a sanctum chamber (rectangle in shape), fronted by three arched-verandahs. Apart from the front court there are open courts on the either side of the main shrine. The left side court contains the *samadhi* of Sri Jeev along with ninety miniature *samadhis* in memory of various lesser known saints. The right side courtyard contains two important structures namely *samadhi* of Sri Roop Goswami and the *bhajanakuti* of Sri Roop Goswami.

There were simple oblong chambers roofed with a palanquin-type vault, which were built in stone. Due to the application of synthetic paint, the colour of the original building material is not visible.

Among the palacial buildings, the Lakshmikunj at Keshi *ghat* (pl.XLVII A) and the Gangamohan Kutchery near new Kalidah, are the most important monuments, built by the Jat rulers of Bharatpur. Both the buildings are remarkable for arcaded-balcony with slender pillars and very neat workmanship. Besides, there are some notable buildings of Alwar and Bharatpur States, located on the Purana Bajaja road.

There are a series of *pucca ghats* along the right bank of the river Yamuna beginning from the Keshi *ghat.* Advancing towards the west one can see the Chir *ghat,* Shringar *vatika,* Rampat *ghat,* Vihar *ghat,* Jugal *ghat,* Nabha *ghat,* Karauli *ghat* and the old Kalidah *ghat.* Keshi *ghat* — the most important and the biggest one, was probably built by the Jat rulers of Bharatpur. A majestic building *viz.,* Lakshmikunj, of the said princely state, stands on this *ghat* (pl.XLVII A). The *ghat* consists of a stone-stepped embankment duly strengthened by the cross buttresses with octagonal pavilion on either end. These pavilions had domed-roof but none of them survived. The Chir *ghat* was originally a stone-stepped *pucca ghat* but the river receded away from this place and the *ghat* suffered from silting. There were eight octagonal kiosks out of which only four had intact domed-roof. There were two oblong structures having palanquin-shaped roof. All the structures were built in red sandstone at the Shrinagar *vatika.* The octagonal kiosks had *pucca ghat.* The steps were buried in silt. The Rampat *ghat,* also a large *ghat* is now in a pitiable condition due to silting and subsequent

constructions. There were eleven octagonal kiosks. The Vihar *ghat,* badly silted with steps covered under the silt contained five kiosks along with well-preserved attached buttresses (pl.XLVII B). Only two domed-octagonal kiosks now survive in the Jugal *ghat* while the Nabha *ghat* and the Karauli *ghat,* built by the princely states, for the palaces known as Nabhakunj and Karaulikunj, located close to these *ghats* respectively, are in good state of preservation. The well-preserved Kalidaha *ghat,* the last *pucca ghat* in the series, was built by the princely state of Indore in AD 1869. In a little distance from this *ghat* is located Ratan *chhatri,* another ancient structure which is notable for its architectural merits (pl.XLVII C).

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

Agra Circle

UTTAR PRADESH

1. AGRA FORT, AGRA, DISTRICT AGRA.— The structures in the third quadrangle of Amar Singh Gate and beyond, were repaired by way of plastering the walls and the work of moulded plaster was also attended to. The fallen/damaged wall of the brick masonry was restored by underpinning.

The draw-bridge over the water-moat at Amar Singh Gate was repaired by replacing the old and decayed wooden sleepers and also by providing additional rolled-steel-joist and its supporting braces.

The cavities of walls near the southwestern corner and rampart in Akbari Mahal were also repaired by way of underpinning. An apron was provided by laying of lime-concrete flooring to the structures standing near the southwestern corner of Akbari Mahal. The repair works of plastering and stained pointing were carried out at the stone structures such as walls, *chhajjas,* roofs and ceilings. Plastering the northern portion of the Jahangiri Mahal and adjoining the Anguri Bagh and stained pointing of the courtyard were also attended to. The flooring was done with red sandstone at the eastern side room. The *fractured farandahs, dasa* and *thevi* of the eastern side verandah were replaced by the new ones. The decayed *thevi* (pillar base) and *dasa* stones were dressed and reset as per the original.

The parapet-wall of Salimgarh on the eastern side was repaired by underpinning of *lakhauri* brick-work and plastering.

2. JAMA MASJID, AGRA, DISTRICT AGRA.— In continuation of the last year's work *(1993-94,* p. 156), the restoration of the southeastern minar (pl.XLVIII) was resumed. The reconstruction of minar was completed by erecting the outer frame of red sandstone consisting of *farandahs* or *qaid* stones succeeded by *dab* stone and the inner space was filled with the reinforced brick-tile masonry. The inlay-pieces were also provided to the outer veneer before erecting the frame work. The minar was raised step-by-step by providing a series of *farandahs* and *dabs* with simultaneous filling of the core. Finally the *chhatri* was constructed as per the original with architectural members namely a series *offarandahs,* pillars, brackets, *chhajjas,* etc. The copper pinacle found during dismantling was fixed as per the original.

3. TAJ MAHAL, AGRA, DISTRICT AGRA.— The badly decayed inlay-panels of facade of the main gate was replaced with new ones and loose inlay-pieces were refixed. Some of the decayed and sunken flooring stones of the central hall of the gateway were replaced with new ones, matching the original.

The broken and missing sloping *chhajjas* of red sandstone of *gaushala* were replaced with new stones. The walls were repaired by underpinning with *lakhauri* brick-work and the open joints were recessed pointed.

After deplastering the decayed plaster of the walls of the glass house nursery, replastering was done as per the original. Besides, underpinning the cavities with bricks, the decayed flooring of the western side was relaid with fresh concrete. The broken and decayed stones of red sandstone veneering, moulded *galta,* niches and inlaid panels of the mosque were repaired by providing fresh veneering stones, architectural members and inlay-pieces of white and black marble. Badly decayed and peeled off special lime-plaster of the intrados having cut flower designs was replastered. The open joints of the outer facade and of the *chhatris* were recessed pointed. Decayed, sunken and broken pieces of flooring in the southern side of the mosque were replaced by new ones maintaining the original pattern. The work is in progress.

The damaged, broken and badly decayed red sandstone of theya//-railing on the southern side of the main mausoleum of Taj Mahal having rich geometrical mouldings and *muttaka* (small stone pillars) in-between the twoya/i-railings with circular mouldings and flowered designs on the top were replaced with new red sandstone (pl.XLIX). The work is in progress. The four broken marble spouts of the railing of the terrace were replaced. The badly decayed, fractured and broken marble *muttakas* having circular mouldings and flowered designs at the top and the two badly decayed railing stones of white marble having grooves for inlay-work on both sides were replaced with new ones. At places the missing inlay-work on black marble was attended to. The work is still in progress. The open joints of marble veneering of the outer facade of main mausoleum, *chhajja-stoneand* railing stones of the southeastern minar were recessed pointed with special lime-mortar. The inlay-work of black and yellow marble stones was restored at places where it was missing in the southeastern minar. The work is still in progress. To protect from constant touches of the visitors an aluminium grill-railing in wooden frame was provided along the marble jali all around at the graves in upper storey. The partly collapsed and bulged wall of *lakhauri* brick-work upon which rests the southwestern corner *bur],* was reconstructed with *lakhauri* brick-work after dismantling the bulged portion. Bulged and broken stones and the sloping *chhajja* near the western gate were repaired by resetting the bulged ones and replacing the broken ones with fresh stones. Fresh lime-concrete was relaid after removing the decayed, dead roofing of the rooms near the western gate. The work of underpinning and pointing of the walls were also undertaken.

4. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.— The *hammam* on the eastern side of sweet tank was repaired by replacing the decayed *dasa* and *farandah* stones by fresh ones. The restoration work of flag-stone flooring and a missing course of rubble-stone wall on the southeastern side of the *hammam* was carried out besides plastering the interiors with lime-cement mortar. The side rampart of the sweet tank was provided with a fine dressed red sandstone flooring.

The *dalans* on the southeastern side of sweet tank were repaired by fixing the *dasa* stones, *farandah* stories, *dab* stones, brackets, *khuntis, chhajja-stones* and the damaged and decayed flag-stone flooring was replaced. The missing course of rubble-masonry wall to the west of verandah was restored and the joints were water-tightened by pointing.

The damaged *chhajja-stones* of Dargah-complex were replaced by fresh ones and the bulged out veneering stones were refixed to the proper place. The Badshahi gate of the mosque was repaired by fixing the flag-stones of the floor. The refixing of loose inlay-stones (pl.L) and restoration of missing inlay-patterns were carried out at Badshahi gate. In the tomb of Islam Khan in the same complex, the pointing work was also attended to.

5. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.— The fallen veneering stones of the main mausoleum were replaced by new ones and the bulged ones were fixed properly. The inlay-work on the main arches in the easW south, west and northern sides was restored as per the original pattern. The missing red sandstones, *dasa* stones of the northern causeway were fixed besides laying lime concrete under the red sandstone flooring. The main mausoleum was replastered after removing the decayed ones. Stained pointing was done to the flag-stone flooring towards southern causeway of the main mausoleum. The missing patches of boundary-wall of the *kanch* mahal were restored. For fencing, iron angles were fixed on the wall. The rooms of this monument were repaired by attending to the works of flooring with flag-stones and plastering the walls.

6. JAGESHVAR TEMPLE, JAGESHVAR, DISTRICT ALMORA.— The construction work of sculpture shed is still in progress.

7. KALINGA MONUMENTS, DEHRADUN, DISTRICT DEHRADUN.— The foundation of the retaining breast wall of the compound was strengthened.

8. MOSQUE AND SARAI, KHUDAGANJ, DISTRICT FARRUKHABAD.— The mosque was repaired by underpinning the back-wall, plastering the walls and dome as also by restoring the lime-concrete flooring. The *sarai* was also repaired by attending to the works of pointing and underpinning.

9. ANCIENT SITE, SANKISA, DISTRICT FARRUKHABAD.— The beautification work was carried out at the site by developing garden, grass strips and hedges. The old structure at the top of the stupa was also repaired.

Aurangabad Circle

MAHARASHTRA

10. HARISHCHANDRAGAD CAVES AND TEMPLE, AKOLA, DISTRICT AHMEDNAGAR.— The work of widening pathway in difficult hilly portion of the approach to the monument was completed.

11. AJANTA CAVES, DISTRICT AURANGABAD.— The damaged retaining wall in front of Cave 4 was reconstructed in rubble-masonry and was plastered and chiselled to match with the rock texture. A parapet was also constructed above the retaining wall. The construction of staff quarters at Fardapur was completed.

12. TOMB OF RABIA DURANI (BIBI-KA-MAQBARA), AURANGABAD, DISTRICT AURANGABAD.— Patch plastering of the compound-wall (inner) on the western side was completed (pi.LI). The damaged patch of Mughal plaster of the main tomb containing ornamental and floral designs was reproduced in lime-mortar as per the original. The ancient fountain system at the entrance was re activated. The work of fencing with barbed-wire in front of the Bibi-Ka-Maqbara, is in progress.

13. FORT, DAULATABAD, DISTRICT AURANGABAD.— Water-tightening of the roof of the main gate of first enclosure and reconstruction of fallen portion of wall along the pathways from Gate 3 to Chand-minar was completed. Besides, the reconstruction of parapet from Ganesh Mandir to Baradari was also attended to.

14. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD.— The work of providing barbed-wire fencing to the caves is in progress. Provision of an iron gate was made at the entrance.

15. GHRISHNESHVARA TEMPLE, VERUL (ELLORA), DISTRICT AURANGABAD.— The worn-out portion of *chhajja* and cornice of the southern *chhatri* was reproduced as per the original. The dome of the *chhatri* was plastered with lime and the roof water-tightened. Missing minarets along the edges of the roof were reconstructed as per the original. Broken stones of the *chhatri* were mended.

16. FORT-WALL AND GATE, PAUNI, DISTRICT BHANDARA.— Apart from concreting the fort-wall, the missing edge stones for the wall walk were provided.

17. KONDAVITE CAVES, DISTRICT BOMBAY SUBARBAN.— The protected area all around the caves was fenced with barbed-wire.

18. MANDAPESHVARA CAVES, DISTRICT BOMBAY SUBARBAN.— The work of providing barbed-wire fencing and chain link fencing to the protected area is in progress.

19. CHANGDEO TEMPLE, CHANGDEO, DISTRICT JALGAON.— The work of reconstruction of southern *prakara-wall* of the temple was completed. The original floor levels were exposed.

20. SHIVNERI FORT, JUNNAR, DISTRICT PUNE.— In addition to the vegetation clearance of the fort-wall, minor repairs to the first gate were carried out.

21. KARLE CAVES, MAVAL, DISTRICT PUNE.— Repairs to the masonry steps from foot of the hill upto the caves were carried out along with the damaged portion of masonry drain.

22. SHANIWARWADA, PUNE, DISTRICT PUNE.— Repairs to the wooden roof of the western cell of the main gate were carried out.

23. ELEPHANTA CAVES, GHARAPUUI, DISTRICT RAIGAD.— The work of reconstruction of fallen retaining wall along the steps leading to the caves was attended to.

24. SINDHUDURG, MALVAN, DISTRICT SINDHUDURG (RATNAGIRI).— The fort-wall was cleared of vegetation. The repair to the ancient well was also carried out.

25. JANJIRA FORT, RAJAPURI, DISTRICT RAIGAD (KOLABA).— Extensive jungle clearance was carried out along with minor repairs to the structures inside the fort.

26. SIVA TEMPLE, AMBERNATH, DISTRICT THANE.— Water-tightening of the main temple was taken up.

27. NALASOPARA (SONAR BHAT), VASAI, DISTRICT THANE.— The ancient site was provided with the barbed-wire fencing.

28. BASSEIN FORT, VASAI, DISTRICT THANE.— The work of plastering the inner walls of Gonsala Church inside the fort, is in progress.

Bangalore Circle

KARNATAKA

29. TIPU SULTAN'S PALACE, BANGALORE, DISTRICT BANGALORE.— The portion of eastern wall damaged due to heavy rainfall was repaired, replastered and applied with suitable colour-wash to match with the wall surfaces. The honey-combed compound-wall was raised to requisite height; grills were repositioned and a new grill gate was added. In order to drain out the rain-water, peripheral brick coping was provided to the basement of the platform.

30. FORT DEVANAHALLI, DISTRICT BANGALORE.— The fallen portion of the fortification-wall was reconstructed using the available original heavy stone-blocks besides pointing the joints suitably.

31. KAMALA BASTI, DISTRICT BELGAUM.— The sunken *mandapa* and the cracked beams of the *navaranga* of the temple were carefully dismantled for resetting. The *adhishtliana* members, pillar capitals, the *kakshasana* slabs, screen-walls, heavy beams and the intricately carved bracket figures and other architectural units including the heavy pendant of the *vitana* ceiling were carefully reset to plumb after strengthening the foundation by providing a concrete bed and uncoursed rubble masonry set in combination mortar. The roof was rendered water-tight by providing fresh lime-concrete and cement-plastering.

32. JUMMA MASJID, SAMPAGAON, DISTRICT BELGAUM.— The decayed stone masonry joints were raked out and fresh pointing done. The leaky-roof was rendered water-tight by laying fresh weather-proof course of lime-concrete after removing the decayed one. Wall and ceilings were given a colour-wash to match with the original.

33. KAMALAPURAM, DISTRICT BELLARY.— The missing portion of the enclosure-wall on the southern side of the *maha-dvara* of the Hazara Ramachandra Temple was reconstructed using new stone veneering members after dismantling the existing ugly looking size stone masonry. The northeastern corner of the garden around the temple was fenced to a length of 69 m after raising a dwarf-wall of 0.60 m height, using crimped wire netting fixed to 'L' angle frames. Wall was veneered with long rectangular blocks of granite and provided with stone coping.

The sunken, fallen and dislodged architectural members (pl.LII) of the Ranga Temple were completely dismantled after due documentation and reconstructed as per the original plan and elevation, after strengthening the foundation with cement-concrete bed and uncoursed rubble-masonry and core filled with rubble and cement-mortar. During the process of levelling the area, the buried architectural members belonging to the superstructure were exposed and stacked for future use. The broken jamb was mended and put in its original position.

Damaged and decayed plastering over the inner walls of the superstructure of the Queen's Bath was carefully scraped and replastered using combination mortar and smoothly finished using white cement. Missing portions of the parapet over the roof was reconstructed using bricks of old

pattern and size, to a height of 0.45 m. The stone masonry-wall and steps inside the bath were neatly finished with white cement mixed with colour oxide to match with the original. The passage was provided with fresh cement-concrete flooring with lime finishing and specially designed iron grill gate was fixed at the entrance to avoid entry of cattle and miscreants during night.

The damaged and fallen outer veneering members of the enclosure-wall on the western side of the Zanana enclosure were dismantled to a requisite height and reconstructed as per the original using available materials. The core was filled with alternate courses of rubble and earth. Similarly, the collapsed portion of the southern enclosure-wall was also reconstructed as per the original, using available members.

34. KRISHNA TEMPLE, KRISHNAPURAM, DISTRICT BELLARY.— The dislodged and out-of plumb *cloister-mandapa* on the southwestern side of the temple was dismantled along with the masonry buttresses and parapet. The same was reconstructed to plumb after due strengthening of the foundation and mending the damaged members using non-corrosive stainless steel dowels and rods. The roof-slabs were repositioned and suitably water-tightened using brick-jelly with lime-combination mortar (pl.LIII).

35. VITTHALA TEMPLE, VENKATAPURAM, DISTRICT BELLARY.— The cracked beams and other architectural members of the eastern *maha-dvara* of the temple were strengthened by using non-corrosive stainless steel rods and fevitite and the sunken, uneven flooring of the passage was relaid after due levelling. The overhanging brick masonry units of the *gopura* were stitched/supported internally using concealed C-section mild steel channels and underpinned to hold them in position.

The architectural members like pillars, capitals, etc., of the *utsava-mandapa* located to the south-east of the eastern *maha-dvara,* outside the *prakara,* were re-positioned to plumb and the sunken and undulated flooring was relaid after levelling.

36. GALAGANATHA GROUP OF TEMPLES, AIHOLE, DISTRICT BIJAPUR.— The damaged and dislodged members of the small temple in the complex were dismantled and reset to plumb by providing missing pillars, lintels and roof-slabs with new ones. Damaged and collapsed size stone masonry compound-wall along the river side is being reconstructed as per the original.

37. HUCHCHAPPAYYAMATHA, AIHOLE, DISTRICT BIJAPUR.— In order to beautify the environs, the protected area around the temple was provided with crimped wire netting fencing over the dwarf masonry-wall that was raised to requisite height. The approach pathway leading to the temple was widened in alignment with the newly provided flight of steps. A specially designed iron gate was fixed.

38. MEGUTI TEMPLE, AIHOLE, DISTRICT BIJAPUR.— The damaged and missing architectural members like pillars, capitals and lintels of the *mukha-mandapa* and the pillared-hall of the temple are being replaced with new ones.

39. VENIYARGUDI, AIHOLE, DISTRICT BIJAPUR.— The damaged and dislodged out-of-plumb architectural members like pillars, lintels and capitals are being reconstructed to plumb following the original plan and elevation.

40. BHUTANATHA GROUP OF TEMPLES (EAST), BADAMI, DISTRICT BUAPUR.— The sunken and out-of-plumb portion on the southeastern coiner of the pillared-hall was dismantled and reconstructed to plumb. The sunken and uneven stone-pavement around the Isvaralinga and Lakulisa temples was laid after due levelling and provided with fresh slabs wherever necessary and the joints pointed. A small shrine near the tank bed which was partly buried was exposed to reveal the elevational details.

41. BHUTANATHA GROUP OF TEMPLES (NORTH), BADAMI, DISTRICT BUAPUR.— The collapsed and buried retaining wall on the rear side of the temple was exposed by earth-work and reconstructed to requisite height using available original material. The damaged culvert provided to regulate the rain-water, was constructed in size stone masonry.

42. CAVES, BADAMI, DISTRICT BUAPUR.— The undulated area in front of Cave I was levelled and paved with sandstone slabs. The coping stones over the fort-wall at Cave 3 are being repositioned. To avoid entry of visitors during late hours a grill gate was provided at the opening leading to the upper fort.

43. MALEGITTI SIVALAYA TEMPLE, BADAMI, DISTRICT BUAPUR.— Flight of steps, leading to the temple on the low hillock were provided afresh wherever missing. The protected premises were enclosed by fencing mounted over dwarf masonry-wall of requisite height and a new grill gate was fixed.

44. ARQUILLA, BUAPUR, DISTRICT BUAPUR.— The fallen portion of the fort-wall was reconstructed following the original plan and elevation and pointed suitably. The thick growth of vegetation on the fort-wall was removed besides levelling the area.

45. BADIKAMAN, BUAPUR, DISTRICT BUAPUR.— The cracks and other damages in the arched gate caused due to the earthquake are being attended to by constructing masonry props following the contour of the arches.

46. GOLGUMBAD, BUAPUR, DISTRICT BUAPUR.— The weathered and dead concrete flooring on the rear side of the Gumbad was removed and relaid with fresh weather-proof lime-concrete. The top surface was plastered. The damaged pipeline supplying drinking water to the visitors was reconditioned by providing new G.I. pipeline.

The damaged and fallen brick and stone members of the ornate *chhajja* of the mosque attached to the Gumbad were suitably mended and repositioned in their respective places.

47. JUMMA MASJID, BUAPUR, DISTRICT BUAPUR.— The fencing of the archaeological area is being taken up.

48. GALAGANATHA TEMPLE, PATTADAKAL, DISTRICT BUAPUR.— The missing diagonal roof members, veneering members of the wall and the basement on the northwestern corner of the temple were provided afresh following the original features.

49. PAPANATHA TEMPLE, PATTADAKAL, DISTRICT BUAPUR.— The damaged and eroded portion of the enclosure-wall towards west of the temple was dismantled and reconstructed using available members and new materials wherever necessary.

50. VIRUPAKSHA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.— The undulated and sunken flooring of the main entrance was relaid after due levelling. Inside the main shrine sandstone pavement was provided wherever missing. The broken capital on the southern side was mended suitably.

51. SANGIT AND NAARI MAHALS, TORVI, DISTRICT BIJAPUR.— The fallen and missing portions of the enclosure-wall and the masonry in front of the tank were reconstructed using available original members and provided afresh wherever necessary and pointed suitably.

52. AMRUTESVARA TEMPLE, AMRUTAPURA, DISTRICT CHICKMAGALUR.— The disturbed out-of-plumb *prakara* on the northern side, which was dismantled earlier was reconstructed to plumb using the available stone-blocks and after consolidating the core. The undulations within the *prakara* area were levelled.

53. FORT AND TEMPLES, CHITRADURGA, DISTRICT CHITRADURGA.— The leaky-roof of the Kasivisvesvara temple was rendered water-tight by brick-jelly and lime-mortar, after raking out the weathered dead concrete. Approach road leading to the temple was repaired by providing stone pitching and flight of steps. The out-of-plumb revetment wall on the rear side of *kamana bagilu* was dismantled and reconstructed to plumb.

54. THREE STONE-BUILT JAINA TEMPLES, MULLUR, DISTRICT COORG.— The leaky-roof of the Jaina *basti* was rendered water-tight by applying 'mendo' non-tar plastic emulsion. The protected premises were fenced with barbed-wire over the dwarf-wall constructed earlier to prevent misuse of the land and entry of the cattle.

55. CHAUTAR PALACE, MUDABIDRI, DISTRICT DAKSHINA KANNADA.— The dead and damaged plaster of the flooring was removed and replastered after due levelling and consolidation. The decayed plaster on the walls of the store rooms to the north and south of the palace were also removed and replastered besides providing steps of laterite stone-blocks to the rooms.

56. MUKTESVARA TEMPLE, CHAUDADANAPURA, DISTRICT DHARWAR.— The sunken and disturbed steps descending from the temple to the river were relaid and rendered functional by consolidating and levelling the area, supplanting with new stone steps wherever necessary. To prevent further erosion near the temple area along the river bank, a revetment of granite stone packing and pitching was also provided.

57. NANNESVARA TEMPLE, LAKKUNDI, DISTRICT DHARWAR.— The *adhishthana* mouldings in the *mukha-mandapa* region, exposed in the process of levelling the area were provided with fresh encasing and the missing floor members of the *mukha-mandapa* were provided afresh. The damaged retaining wall was reconstructed and grills refixed.

58. BASAVANNA DEVA TEMPLE, TAMBUR, DISTRICT DHARWAR.— The bulged portions of the walls of the *mukha-mandapa* were dismantled and reconstructed as per the original after duly consolidating the foundation and core filling. The leaky-roof disturbed during the process was rendered water-tight by laying a fresh weather-proof course.

59. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.— The broken beam of the northern entrance, dismantled earlier, was strengthened using concealed I-section girder of required size. After repositioning all the beams and roof-slabs, disturbed in the process, were rendered water-tight. The missing veneering members on the inner face on either side of the entrance and stone flooring in the missing portion of the northern entrance were provided afresh.

60. LAKSHMINARASIMHA TEMPLE, NUGGEHALLI, DISTRICT HASSAN.— The platform all around the *pakasala (madappali)* was dismantled and reconstructed as per the original plan and elevation using the same materials. The dead plaster over the walls of the *pakasala* and the Alvar shrine was raked out and replastered in combination mortar. The repaired doors and windows of the *pakasala* were painted.

61. LAKSHMINARASIMHA TEMPLE, MAREHALLI, DISTRICT MANDYA.— The fallen and out-of-plumb stone outer veneering members of the Amritesvara temple in the complex were dismantled and reconstructed to plumb.

62. ANCIENT PALACE SITE, SRIRANGAPATNA, DISTRICT MANDYA.— The exposed structural remains of the ancient palace were consolidated by pointing and plastering wherever necessary.

63. DARIYA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.— The damaged cattle-trap provided earlier was removed, refabricated and refixed.

64. RANGANATHASVAMY TEMPLE, SRIRANGAPATNA, DISTRICT MANDYA.— The damaged stucco figures on the Haider Ali *mandapa* were mended using fine quality smooth lime-plaster and given a colour-wash in water-proof cement to match with the original.

65. THOMAS INMAN'S DUNGEON, SRIRANGAPATNA, DISTRICT MANDYA.— The disturbed and collapsed retaining wall on the eastern side was reconstructed after laying suitable foundation. The joints of the stone masonry was pointed.

66. SRIKANTHESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.— The decayed mortar between the joints of the flooring were carefully raked out and pointed in combination mortar. One of the broken beams was strengthened by introducing I-section girder of suitable size. The damaged stucco work of the niche over Ganesa was mended as per the original and the skylights over the roof were provided with wire-mesh.

67. TRIPURANTAKESVARA TEMPLE, BELLIGAVI, DISTRICT SHIMOGA.— All the modern accretionary structures in the newly acquired area around the temple were dismantled. Fencing of the archaeological premises is in progress.

68. KAITABHISVARA TEMPLE, KOTIPURA, DISTRICT SHIMOGA.— The joints of the roof-slabs were pointed with cement-mortar and concrete hoods were provided to arrest water percolation.

69. SHIVAPPA NAYAKA'S FORT, NAGAR, DISTRICT SHIMOGA.— Heavy rank vegetation grown over the fort-walls and bastions were removed by applying suitable tree killer solution. The missing portion of the retaining wall of the small pond was reconstructed following the original pattern. The

tank near the entrance of the fort was desilted and the fallen architectural members were stacked for re-use.

70. FORT, MADHUGIRI, DISTRICT TUMKUR.— The damaged brick masonry parapet over the stone masonry-wall was reconstructed, plastered and given a colour-wash to match with the original.

71. KEDARESVARA TEMPLE, NAGALAPURA, DISTRICT TUMKUR.— The bulged and out-of-plumb portion of the temple wall dismantled earlier was reconstructed to plumb after consolidating the foundation. The protected area around the monument was fenced with barbed-wire tied to angle iron poles positioned at regular intervals.

72. MADHUKESVARA TEMPLE, BANAVASI, DISTRICT UTTARA KANNADA.— The out-of-plumb portion of the northern enclosure-wall of the temple dismantled earlier, was reconstructed as per the original using the available materials. The weathered and damaged superstructure and pilasters of the sub-shrines on the western side of the temple were also repaired. The leaky-roof of the sub-shrines were plugged by grouting the cracks. The damaged portion of the *chhajja* of the northern entrance was mended.

73. PARSVANATHA BASTI, BHATKAL, DISTRICT UTTARA KANNADA.— The damaged leaky-roof of dilapidated *navaranga* of the temple was rendered water-tight by laying a fresh weather-proof course. The sunken and undulated flooring of the *navaranga* and the *pradakshinapatha* were relaid after due levelling and replacing the damaged slabs.

Bhubaneswar Circle

MADHYA PRADESH

74. CHANDRADITYA TEMPLE, BARSOOR, DISTRICT BASTAR.— The restoration of dilapidated missing outer wall of *sikhara* of the temple was taken up and completed (pl.LIV).

75. BRICK TEMPLE ATANDAL DEUL, KHAROD, DISTRICT BILASPUR.— The *sikhara* portion of the brick temple (Andal Deul) at Kharod fallen due to heavy rain was strengthened by bamboo scaffolding and wooden posts all around the temple to arrest further fall of bulged-out portion. The bricks were also strengthened by pointing the open joints with combination mortar.

76. KANTI DEUL, RATANPUR, DISTRICT BILASPUR.— In continuation of the previous year's *(1993-94,* p. 167) work, the reconstruction of the first floor of *garbhagriha* was taken up (pl.LV). Carved ornamental architectural members on both outer and inner sides, assembled in receding order, were fixed. The damaged architectural members were carved out afresh and refixed as per requirement.

77. LAXMAN TEMPLE, SIRPUR, DISTRICT RAIPUR.— The work of water-tightening the *sikhara* of the temple was completed.

ORISSA

78. SIMHANATHA MAHADEVA TEMPLE, GOPINATHPUR, DISTRICT CUTTACK.— The undulated stone-paved floor of the courtyard was removed and reset.

Iron grills over compound-wall were provided all around the temple-complex. Grill gates were also provided on three sides of the complex.

79. EXCAVATED BUDDHIST SITE, LALITAGIRI, DISTRICT CUTTACK.— Besides clearing the exposed structures, the damaged and missing flag-stones, the *pradakshinapatha* of the stupa was restored. Brick-paved apron was provided around the monastic-complex. Pathway has been laid to connect the village with the monasteries and the sculpture shed.

80. GROUP OF MONUMENTS, MAHENDRAGIRI, DISTRICT GAJAPATI.— The general clearance around the monument was completed. The floor in front of the temples *viz-,* Yudhisthira and Bhima, was concreted.

81. JAGANNATHA TEMPLE-COMPLEX, JAJPUR, DISTRICT JAJPUR.— The conservation measures undertaken during the year under review include uprooting of vegetation, plastering and filling up of cracks of the *sikhara* and levelling of the surroundings.

82. EXCAVATED BUDDHIST SITE, UDAYAGIRI, DISTRICT JAJPUR.— The work of providing pathway connecting the exposed monastic-complex was completed.

The work of clearance and beautification at the site and its surroundings was also completed.

The stupa along with compound-wall was restored as per the original. A new staircase was also provided on the eastern side.

The damaged walls of the structures of the complex were repaired and the floors were paved with brick-jelly concrete.

83. ROCK-PAINTINGS, SITABHANJI, DISTRICT KEONJHAR.— A *pillared-mandapa* was constructed to accommodate the loose *panchamukha-linga* of fifth-sixth century AD. The grill around the *mandapa* was fixed.

84. UDAYAGIRI-KHANDAGIRI JAINA CAVES, BHUBANESWAR, DISTRICT KHURDA.— The pathways from the main entrance towards Ranigumpha were concreted. The missing southern side courtyard of Ranigumpha was concreted and provided with flag-stone.

85. CHAUSATH YOGINI TEMPLE, HIRAPUR, DISTRICT KHURDA.— The outer wall of the temple was recessed pointed. The *bhogashala* and store room within the temple-complex were provided with RCC roof.

86. ROCK-CUT CAVES, DHAULI (NEAR BHUBANESWAR), DISTRICT KHURDA.— The existing steps leading to the rock-cut elephant were concreted. The stone-pavement in front of the rock-edict was pointed. The construction of a dwarf-wall at the back side to check overflow of rain-water and a water tank inside the complex was done.

87. SISUPALGARH NEAR BHUBANESWAR, DISTRICT KHURDA.— The exposed laterite stone-blocks of the gateway on western side were levelled and reset. The top roof and the wall were also strengthened by water-tightening.

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88. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT KHURDA.— Dismantling of the damaged, undulated/laterite 'stone-pavement including the removal of debris at southern side and sand padding were taken up. Renewing and resetting laterite/sandstone-pavement duly dressed and cut to required size and shape over sand padding in cement-mortar was successfully completed. Missing stone-blocks of the pavement and worn-out architectural members *oipidhas* of the *bhoga-mandapa* were replaced and reset. Renewing the undulated stone-pavement on southern side of the complex is in progress. Grouting, pointing and underpinning the corbels and crevices of Laxmi-Narasimha temple in the complex were also undertaken and completed.

The construction of the missing rooftop of the Mayur Vihar in the complex was also attended to and completed with the help of newly carved stone-blocks.

The consolidation of inner core of the stone masonry of the Ganesa temple inside the complex was done.

89. HARIPURGARH, MAYURBHANJ, DISTRICT MAYURBHANJ.— A compound-wall was constructed
in front portion of the area with provision of gate besides fencing the western side with barbed-wire. The repairs to the missing pillars and the Rasika Raya Temple (pl.LVI) are in progress.

90. DAKSHYAPRAJAPATI TEMPLE, BANPUR, DISTRICT PURI.— Laterite stone-pavement was provided on the eastern side of the temple-complex. The assorted enamel paintings were applied on the existing grill gates and doors while loose bronze sculptures were secured in a grill caging.

91. SUN TEMPLE, KONARAK, DISTRICT PURL— The covering of exposed laterite core of the north-west side of platform with khondalite stone-blocks is in progress.

92. JAGANNATHA TEMPLE, PURI, DISTRICT PURL— In continuation of the previous year's *(1993-94,p.* 168) work, the damaged veneering stones on the south-east corner were replaced by using steel dowels and epoxy. Pinning in the vulnerable points of the superstructure was done after drilling of holes and grouted with epoxy resin.

The deplastering of the remaining portion on the western and the southeastern sides, to bring uniformity in the level, leaving 2.5 m from top upto the *amalaka* level, was also attended to and the work on the eastern and the southeastern sides is in progress. Taking out-of-plumb stones and refixing them with epoxy resin mortar with stainless steel pins and refixing some of them with new stones with combination mortar was completed.

The much damaged veneering stones on the south-east corner of *sikhara* was removed and refixed by the newly carved stones as per the original.

Recess pointing of the wide open joints with combination mortar on the western and southern sides was also carried out.

Refixing of new stones on the south-east region of dismantled Khirachora Gopinatha Temple was also taken up and the work is in progress. Recess pointing with combination mortar on the east and south sides upto *beki* level was completed. The damaged *sikhara* of the eastern portion of the temple was dismantled and rebuilt with the help of newly dressed stone-blocks as per the original.

Calcutta Circle

WEST BENGAL

93. PATPUR TEMPLE, BISHNUPUR, DISTRICT BANKURA.— The porous and decayed lime-concrete from the roof and the verandah was removed. The undulated area was levelled in addition to stitching cracks in the *sikhara, garbhagriha* and stairs.

94. JOR MANDIR, BISHNUPUR, DISTRICT BANKURA.— The wide cracks and voids were repaired and the interior wall surface was treated with proper lime punning while the roof water-tightened with due terracing and the floor lime-concreted. A brick-apron was provided.

95. SAILFSVARA AND SARESVARA TEMPLES, DIHAR, DISTRICT BANKURA.— Roofs of both the temples were lime-concreted. All around the temple a brick-apron was provided. The corner cracks were water-tightened by stitching and the walls were replastered.

96. LALJI TEMPLE, BISHNUPUR, DISTRICT BANKURA.— The brick-on-edge aporn was provided all around the temple. The exterior portion of the temple was replastered and the roof of the *bhog-gharwas* also repaired.

97. GROUP OF TEMPLES, KALNA, DISTRICT BARDHAMAN.— The roofs of the Gobardhan and Rama-Sita Temples in the Krishnachandrajew-complex were renewed with lime-concrete terracing including the re-laying of their floors. The cracks in the walls were stitched with necessary brick work and replastered. The missing arches of the *rasmancha* were re-constructed as per the original. The worn-out brick-works in the upper part of the Pratapesvara temple were replaced and re-newed as per the original. The damaged cells at the entrance of the Rajbari gateway have been brought to the original shape with necessary brick-work. The cells in the Lalji temple-complex were restored with proper brick-work and roof-terracing. The sunken inner courtyard was raised to its proper level to prevent water stagnation at the foundation level.

98. METCALFE HALL, CALCUTTA, DISTRICT CALCUTTA.— The growth of wild plants from the parapet-wall of the building was removed. The damaged brick walls were carefully dismantled and the serviceable material was utilized in the brick-works. The drain around the monument was also restored.

99. MAHARSHI BHAVAN, JORASANKO, DISTRICT CALCUTTA.— Damaged beams and *burgahs* were replaced by new ones with proper treatment of the roof by lime-concrete: The cracks and voids were stitched and worn-out wooden doors (pl.LVII) and windows were repaired.

100. COOCH BEHAR PALACE, COOCH BEHAR, DISTRICT COOCH BEHAR.— The dead mortar of the roof on the northwestern side was removed, re-laid and finished with tarpelter in *lime-surkhi* mortar. The replastering of the parapet-wall was done after removing the old and damaged ones. The cracks and fissures in the roof were treated with cement epoxy grouting. To prevent leakages in the roof, a layer of araldite mortar was spread besides applying the usual water-proofing treatment (pl.LVIII).

101. HAZARDUARI PALACE, MURSHIDABAD, DISTRICT MURSHIDABAD.— The old and decayed tarfelting from an exterior of the dome of the Durbar Hall along with the dead lime-mortar below it

were removed. The entier roofing of the dome was re-laid. The glazed ventilators in the upper part of it were repaired and water-tightened. The stucco-work at the intrados was restored.

Chandigarh Circle

HARYANA

102. BAOLI GHAUS ALI KHAN, DISTRICT GURGAON.— Restoration of cells and staircase of the Baoli including the random rubble-masonry was attended to. The plaster was reproduced matching the original.

103. ANCIENT STUPA, AGROHA, DISTRICT HISSAR.— The ancient stupa-complex was restored by pointing, underpinning, water-tightening the structures (pl.LIX).

104. LAT OF FEROZSHAH, FATEHABAD, DISTRICT HISSAR.— The patches of country brick-masonry in lime-cement *surkhi* were attended to.

105. BARSI GATE, HANSI, DISTRICT HISSAR.— The work qf underpinning, water-tightening, pointing and restoration of masonry of both sides of the gate was attended to.

106. PRITHVIRAJ CHAUHAN FORT, HANSI, DISTRICT HISSAR.— In order to drain out rain-water, the pipes were provided over brick-masonry.

107. FEROZSHAH PALACE, HISSAR, DISTRICT HISSAR.— The work of underpinning, water-tightening and restoration of *tehkhana* wall/cell with R.R. masonry including pointing were attended to. The pathway was restored.

108. MUGHAL SARAI, GHARAUNDA, DISTRICT KARNAL.— The construction of boundary-wall in brick-masonry was completed.

109. RAJA HARSH-KA-TILA, KURUKSHETRA, DISTRICT KURUKSHETRA.— Excavated structures were restored by resetting and pointing in mud lime-mortar (LX).

110. SHEIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA.— The old pulverized cement plaster was removed from the cells on the southern side and damaged, bulged-out portions of the brick-masonry wall were removed and repaired by underpinning (pl.LXI).

111. KHWAJA KHIZIR'S TOMB, SONEPAT, DISTRICT SONEPAT.— The courtyard in front of the tomb was paved with brick flooring.

HIMACHAL PRADESH

112. NARBADESHVARA TEMPLE, SUJANPURTIRA, DISTRICT HAMIRPUR.— Providing and laying of flag-stone flooring in the courtyard was taken up and completed.

113. SIDHNATH TEMPLE, BAIJNATH, DISTRICT KANGRA.— The *sikhara* was water-tightened while the cracks and joints were filled up and pointed (pl.LXII).

114. SIVA TEMPLE, BAIJNATH, DISTRICT KANGRA.— The open joints, cracks and voids of the *sikhara* were filled up by grouting and resetting the stones. The pond was also repaired.

115. HIDIMBA DEVI TEMPLE, MANAI.I, DISTRICT KUIXU.— The decayed wooden member of the roof and doors of the *sarai* were replaced and slate stones refixed. The toilet-block was also constructed. ,

116. BUDDHIST MONASTERIES, TABO, DISTRICT LAHAU'L AND SPITI.— The platform of the *Chortens* were repaired and exterior walls plastered.

117. MIRKULA DEVI TEMPLE, UDAIPUR, DISTRICT LAHAUL AND SPITI.— The retaining wall on the hill side and back side of the temple was further extended.

118. TRILOKINATH TEMPLE, MANDI, DISTRICT MANDI.— The steps and the platform were repaired and joints pointed.

PUNJAB

119. DAKHNI SARAI, DAKHNI, DISTRICT JALANDHAR.— The work of providing and laying cement-concrete over the roof of the *sarai,* restoration and reproduction of country/tile brick masonry, pointing the joints of *lakhauri/tile-brick* exactly matching the adjacent were taken up.

120. MUGHAL BRIDGE, JAHANGIR, DISTRICT JALANDHAR.— Restoration and reproduction of brick flooring, underpinning, water-tightening and restoration of disturbed masonry over concrete base, pointing the joints exactly matching the original were taken up and completed.

121. NAKODAR TOMB, NAKODAR, DISTRICT JALANDHAR.— The pathway was repaired by relaying bricks over the concrete base.

122. NOORMAHAL SARAI, NOORMAHAL, DISTRICT JALANDHAR.— The work of restoration, reproduction, underpinning, water-tightening of arches and domes etc., and pointing the joints of mosque, were attended to (pl.LXIJJ).

123. Kos MINAR, SAHNEWAL, DISTRICT LUDHIANA.— The Kos Minar was repaired and the platform restored.

Delhi Circle

DELHI

124. JAMI MASJID, DELHI. — The fallen small turret on the south-east corner of the gate and the missing top Guldasta were repaired.

125. RED FORT, DELHI.— In continuation of the previous year's *(1993-94,* p. 171) work, the fountains in front of the Rang Mahal were fixed and plastered as per the original (pl.LXIV).

126. QUTB MINAR, QUTB, NEW DELHI.— In continuation of the previous *(1993-94,* p. 172) year's work, the restoration of decayed and worn-out veneering stones of the fluting was continued by strengthening the inner core and interlocking the veneering stone with non-rusting copper clamps (pi. LXV).

127. TUGHLAQABAD FORT, TUGHLAQABAD, NEW DELHI.— The dilapidated bastion abutting southern side of fortification-wall was taken up for repairs by removing the loose masonry, filling up

the core with stone masonry and restoring the bastion as per the original (pl.LXVI). The joints were pointed and the top water-tightened.

Hyderabad Circle

ANDHRA PRADESH

128. SRI MALLIKARJUNA SVAMI TEMPLE, KAMBADURU, DISTRICT ANANTAPUR.— To prevent encroachments, the work of fencing the protected area with the barbed-wire is in progress.

129. VIRABHADRA SVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.— The undulated stone flooring of *Somavara-mandapa* was removed and relaid properly. Water pipeline was extended from the monolithic *nandi* to the main temple for making provision of drinking water as also to maintain the garden around the main temple. Repairs to the water tank was also attended to.

130. RAMA'S BASTION, PENUKONDA, DISTRICT ANANTAPUR.—*r* Major structural repairs like stitching the cracks in the masonry walls, restoration of missing portion of dilapidated balconies, roof and *chhajjas* in conformity with the original replastering, water-tightening and colour-washing were attended to (pl.LXVII).

131. SRI KRISHNA TEMPLE, HILL FORT, RAYADURG, DISTRICT ANANTAPUR.— The undulated flooring of Rama Temple was removed and relaid with hydrated lime. Recess pointing was done to the existing stone flooring at Rama and Krishna temples, besides resetting the damaged platforms. The breaches in the compound-wall around the Rama and Krishna Temples were also reconstructed as per the original. The *garbhagriha* doorway was provided with a M.S. grill door.

132. SRI CHINTALA VENKATARAMANA TEMPLE, TADIPATRI, DISTRICT ANANTAPUR.— Major structural repairs like removing the cracked stone beams, lintels etc., and replacing them with new ones, strenghthening the existing brick-work have been taken up and are still in progress.

133. CHANDRAGIRI FORT, CHANDRAGIRI, DISTRICT CHITTOOR.— In order to expose the outer *prakara-wall* and also to retrieve buried architectural members of the temple-complex, the accumulated debris was removed. The work of resetting some parts of the inner prakara-wall was also attended to with the available material.

Around the Rani Mahal-complex, concrete apron was provided to prevent seepage of rain-water into the foundation. Resetting and water-tightening of the plinth and walls around Rani Mahal and the work of exposing the buried structure on the western side are in progress.

The collapsed portion of the outer fortification-wall was restored as per the original. The roof of Anjaneya shrine and the outer entrance of the fortification-wall were water-tightened and the open *mandapas* were provided with chain linked diamond mesh to avoid its misuse.

134. SRI PARASURAMESVARA SVAMI TEMPLE, GUDIMALLAM, DISTRICT CHITTOOR.— The remaining work of replastering the damaged *sikhara* was completed.

135. SRI PARASURAMA SVAMI TEMPLE, ATTIRALA, DISTRICT CUDDAPAH.— Besides providing a teakwood door to the temple, all around the temple was fenced with barbed-wire.

136. FORT, GANDIKOTA, DISTRICT CUDDAPAH.— The work of replastering the damaged lime-concrete floor, pillars and outer cells and repairs to the damaged fencing are still in progress.

137. SRI SOUMYANADHA SVAMI TEMPLE, NANDALUR, DISTRICT CUDDAPAH.— The work of strengthening the damaged eastern *gopuram* and restoration of the fallen portion of the *prakara-* wall on the southern side are in progress.

138. SIDDHAVATTAM FORT, SIDDHAVATTAM, DISTRICT CUDDAPAH.— The works of strengthening and replacing the broken beams and providing water-proof course over the roof of the second *mandapa* after removing the rank vegetation, mud filling and decayed brick lining are in progress.

139. SRI KODANDARAMA SVAMI TEMPLE, VONTIMITTA, DISTRICT CUDDAPAH.— The works of providing water-proof course on the exterior of the southern *coloistered-mandapa* and stone pitching to the floor are in progress.

140. BUDDHIST REMAINS, ADDURU, DISTRICT EAST GODAVARI.— The newly exposed brick structures *viz.,* spoked stupas, stupa *chaityas,* votive stupas around the Maha-stupa were strengthened and water-tightened at the top. The damaged barbed-wire fencing around the protected monument was also replaced.

141. SRI GOLINGESVARA SVAMI TEMPLE, BICCAVOLU, DISTRICT EAST GODAVARI.— The dead lime-plaster over the interior of the entrance *gopura* was removed and replastered and finally applied with finishing coat on both interior and exterior.

142. SRI BHIMESVARA SVAMI TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI.— The damaged lime-plaster on both interior and exterior of the northern *gopura* was replastered and" underpinning was done wherever necessary.

143. MAHA-STUPA, AMARAVATI, DISTRICT GUNTUR.— The work of clearing the earthen deposit from the southern side of the Maha-stupa has been in progress.

144. SRI KAPOTESVARA SVAMI TEMPLE, CHEJARLA, DISTRICT GUNTUR.— The bulged-out portion of the inner stone *prakara-wall* was dismantled and reconstructed including the fallen portion as per the original.

145. RECONSTRUCTED MONUMENTS, NAGARJUNAKONDA, DISTRICT GUNTUR.— The work of removing and resetting the broken and dislodged Cuddapah slabs at the bathing *ghat* is in progress (pl.LXVIII).

146. GOLKONDA FORT, GOLKONDA, DISTRICT HYDERABAD.— The work of replastering the interiors of the southern side African body guard rooms is in progress.

The damaged arch and portion of roof of the judgement hall in Rani Mahal-complex was rebuilt as per the original.

147. FORT, BANDAR, MACHILIPATNAM, DISTRICT KRISHNA.— The structures were cleared off all vegetational growth and the debris were removed for rebuilding the collapsed wall matching with the original.

148 ROCK-CUT CAVES (NATARAJA CAVE), MOGALRAJAPURAM, VUAYAWADA, DISTRICT KRISHNA.— The removal of damaged barbed-wire fencing and construction of a dwarf cut-stone masonry wall for providing a new diamond mesh fencing are in progress.

The crevices over the caves were cleared and grouted to stop seepage of water.

149. SRI RAMALINGESVARA SVAMI TEMPLE, VELPUR, DISTRICT KRISHNA.— TO prevent encroachments, the protected area was fenced with barbed-wire and small portion of stone veneering of a temple was also restored.

150. SRI UMA-MAHESVARA SVAMI TEMPLE, YAGANTI, DISTRICT KURNOOL.— Providing a buttress wall to support the disturbed Raja *gopuram* and repairs to the damaged stucco-work of the *gopura* are in progress.

151. NAVABRAHMA GROUP OF TEMPLES, ALAMPUR, DISTRICT MAHABOOBNAGAR.— Openings of
the roof of the Arka Brahma Temple were provided with new roof-slabs and finally plastered with a layer of brick-jelly concrete. The damaged mud parapet-wall was also removed and rebuilt in cement-mortar. The flooring inside the Arka Brahma Temple was reset.

152. PAPANASI GROUP OF TEMPLES, ALAMPUR, DISTRICT MAHABOOBNAGAR.— The works of providing stone-slab flooring inside the temple and stone apron around them were completed. Cut-stones of Cuddapah slabs were provided along the pathways.

153. SRI KUDALI SANGAMESVARA TEMPLE, ALAMPUR, DISTRICT MAHABOOBNAGAR.— The remaining work of fixing a gate and painting of fencing was completed.

154. FORT AND GROUP OF TEMPLES, UDAYAGIRI, DISTRICT NELLORE.— The work of reconstructing a part of *prakara-wall* of the *kalyana-mandapa* and mending the brick-work of the *gopura* are still in progress.

155. PITTIKESVARA GROUP OF TEMPLES, PITTIKAYAGULLA, DISTRICT PRAKASAM.— Fixing of new wooden doors to the small shrines was completed.

156. SRI BHIMESVARA SVAMI TEMPLE, SATYAVOLU, DISTRICT PRAKASAM.— Photographic documentation and preparation of detailed drawings and numbering of architectural components and sculptures were compeleted before dismantling and reconstructing a new foundation.

157. BUDDHIST REMAINS, SALIHUNDAM, DISTRICT SRIKAKULAM.— The dislodged and damaged random rubble-stone apron and revetment near the structures at various levels were removed, repacked and finally the top layers were water-tightened. The work of providing barbed-wire fencing with granite posts along the protected area on the village side is in progress.

158. BUDDHIST REMAINS, RAMATIRTHAM, DISTRICT VIZIANAGARAM.— The damaged and disturbed brick structures over the Durgam Konda *viz.,* stupa *chaitya,* Maha-stupa were strengthened and water-tightened. The disturbed ancient stone steps leading to the monument were also reset.

159. EASTERN GATEWAY OF MUD-FORTIFICATION, WARANGAL FORT, DISTRICT WARANGAL.— The weakened arch entrance gateway was consolidated by underpinning, repointing and concreting on the top. Missing portions of the small arches in the side wall were restored as per the original.

160. THOUSAND-PILLARED TEMPLE, HANAMKONDA, DISTRICT WARANGAL.— A part of the disturbed *pradakshinapatha* to the northern side of Vishnu shrine was removed and is being reset over a new foundation.

161. RAMAPPA TEMPLE, PALAMPET, DISTRICT WARANGAL.— The leaky-roof over the *maha-mandapa* was replastered to provide a chemical coat to stop seepage of water.

Jaipur Circle

RAJASTHAN

162. MARBLE PAVILIONS, BALUSTRADE AND MARBLE HAMMAM, ANASAGAR BANDH, AIMER, DISTRICT AJMER.— In continuation of the last year's work *(1993-94,* p. 176), the dismantling of the loose, decayed and cracked concrete of the platform floor and relaying the fresh concrete were further continued. The decayed loose plaster of the face wall of the platform was removed and replastered.

163. ANCIENT SITE, BHANGARH, DISTRICT ALWAR.— The buried fortification-wall on southern side was exposed by removing fallen debris along its sides and clearing loose stones. The fallen portions were restored. The construction of the pathway from Bazar to Gopinath Temple in R.R. masonry is in progress.

In continuation of the last year's work *(1993-94,* p. 176), further work on southern side Bazar, shop nos. 21 to 40 was taken up and the buried shops were exposed and repaired. The portion of northern side bazar, shop nos. 51 to 68 was exposed and repaired.

164. LAL MASJID, TIZARA, DISTRICT ALWAR.— Damaged portions of the wall and the roof were restored and the open joints pointed.

165. DIG PALACE, DIG, DISTRICT BHARATPUR.— In continuation of the previous year's work *(1993-94,* p. 177), further work of restoration of the collapased wall of Singh Pol was continued by providing and laying bed concrete in foundation and random rubble-masonry in plinth and superstructure. Plastering the top of the wall, underpinning and pointing of adjacent portion of the exterior wall were carried out. Repair of fencing was also done.

Repairs to Sawan Bhawan was continued by providing and laying lime-cement concrete and finishing the basement floor.

The decayed plaster from the walls of Hardev Bhawan on the eastern side and concrete of the floor are being removed.

Repairs to the fountains were also attended to by dismantling and relaying the bed concrete and pipelines.

To prevent rain-water going into the Maharani room it was covered with stone-slabs and brick-masonry supports were provided wherever necessary.

166. FORT, BHARATPUR, DISTRICT BHARATPUR.— Patch repairs to the fort-wall from Chouburja Gate to Ashtadhatu Gate was taken up.

167. ANCIENT MOUNDS, KALIBANGAN, DISTRICT HANUMANGARH.— In order to prevent encroachments, the acquired area was fenced with barbed-wire.

168. BHATNER FORT, BHATNER, DISTRICT HANUMANGARH.— Patch repairs to the fort-wall of Bastion 8 and 9 were carried out matching the original.

169. FORT, JAISALMER, DISTRICT JAISALMER.— The work of dismantling of bulged and weathered masonry of wall with the help of chain pulley upto the height of 10 meter and its reconstruction by ashlar masonry for the facing and random rubble-masonry in lime-cement mortar on the back were carried out. This was undertaken by providing weep-holes and by using old serviceable and new stones after proper dressing and maintaining the batter to match as per the original.

Reconstruction of dismantled portion of the collapsed lower fortification-wall along Shiv Marg is in progress.

170. BUDDHIST CAVES, KOLVI, DISTRICT JHALAWAR.— Earth work for parapet, retaining wall and R.R. stone-masonry is in progress.

171. SHIKARGAH, DARA, DISTRICT KOTA.— The works of clearing debris, R.R. masonry of the fort-wall besides collecting materials were taken up.

172. FORT, KUMBHALGARH, DISTRICT RAJSAMAND.— In continuation of the last year's work *(1993-94,* p. 178), cracked heavy stone lintels of Bawan Deori, were supported by stone-masonry mud-mortar walls and strengthened by providing concealed R.S. joists inside the broken stone lintels after cutting chases in the lintels and finishing the outer surface, matching the original in colour and texture. Temporary masonry supports were removed after completing the work. Patch-work and pointing the brick *sikhara* have also been done.

The works of preparing subgrade by cutting hard soil mixed with boulders and filling the same wherever necessary, construction of pathway with R.R. masonry in lime-cement mortar and brick zeera from Ram Pol to Bhairon Pol were carried out.

In continuation of the last year's work, reconstruction of the *sabha-mandapa* of Golerao Temple 2 upto lintel was completed, for which structural members were available at the site. Dismantling of dislodged and vegetation infested stone flooring around the temple and relaying of lime-cement concrete were also carried out (pl.LXIX).

173. FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR.— Dismantling of old worn-out steps/ pathway leading to the fort and resetting the same as per the original, matching in colour, texture and material were carried out.

Clearance of *malba* of fallen R.R. masonry-wall, sorting out the serviceable material, reconstruction of the collapsed wall near Ganesa Pol and Supari Mahal were taken up.

Dismantling of damaged enclosure-wall of Padamla Tank and restoration of dismantled/ missing wall in R.R. masonry, pointing and water-tightening of the top of the wall were undertaken.

VIA. KALYANRAUI TEMPLE, TODA RAI SINGH, DISTRICT TONK.— In continuation of the last year's work *(1993-94,* p. 178), R.R. masonry work in lime-cement mortar in the compound-wall, room attached to the temple, pointing and plastering of the damaged walls after dismantling of decayed portions, cutting of small trees from the top of the *sikhara* of the temple and sealing the joints were carried out.

Lucknow

Circle UTTAR

PRADESH

175. EXCAVATED SITE, SRINGAVERAPURA, DISTRICT ALLAHABAD.—A drain has been provided around the excavated area to prevent the rain-water.

176. CEMETERY, KYDGANJ, DISTRICT ALLAHABAD.— After dismantling the west side damaged wall, a cement-concrete foundation was provided.

177. EXCAVATED SITE, KAUSHAMBI, DISTRICT ALLAHABAD.— To facilitate the movement of visitors around the excavated site, pathways with brick-on-edge on either side are being provided. Fresh pointing on brick-on-edge on both the sides has also been done.

178. EXCAVATED SITE, SAHET (SRAVASTI), DISTRICT BAHRAICH.— Temples 1,5 and 19 were repaired by way of underpinning, water-tightening and pointing. The work is in progress.

179. SHUJA-UD-DAULA'S TOMB, GULAB BARI, FAIZABAD, DISTRICT FAIZABAD.— Fresh lime-plaster both, plain and richly moulded with floral and geometrical design is being provided on the first and third floor facade of the main tomb. The work is in progress.

The flooring on the ground floor with flag-stones and the pointing the joints with matching mortar have been completed. The ground floor facade of the tomb has been colour matched.

180. MOSQUE, GULAB BARI, FAIZABAD, DISTRICT FAIZABAD.— After carefully removing the pulverized plaster, the fresh lime-plaster with simple as well as moulded and carved floral and geometrical design is being provided on the inner side facade adjoining north side of entrance gate facing east. The work is in progress.

181. BANI KHANAM'S TOMB, FAIZABAD, DISTRICT FAIZABAD.— The decayed and peeled off plaster on the walls, ceilings, spires, arches; cornices on the south and east side of the ground floor etc. has been replaced with fresh one including richly moulded designs. The work is in progress.

182. BAGH BADSHAHI, KHAJUA, DISTRICT FATEHPUR.— The north side wall of Bagh Badshahi was repaired.

183. JHANSI FORT, JHANSI, DISTRICT JHANSI.— The ceilings-of the cells on the right side of the approach road to Siva Temple were relaid by using random rubble-stone laid in cement, unslacked lime and coarse sand. Thick concrete flooring was provided with mixing black oxide and red oxide to match the shade. The outer wall joints were pointed.

184. KALINJAR FORT, KALINJAR, DISTRICT BANDA.— The fortification-wall of the fort which was damaged and bulged near Neelakantha Temple was restored by resetting and pointing of stone

slabs of stairs leading to the temple and reconstruction of rubble-masonry wall. Similarly, the fallen fort-wall was restored near the entrance point to the fort through the road. Here too, the debris was cleaned by dismantling and taking out the loose bulged stones.

185. ASAF-UD-DAULA'S IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.— The damaged flooring of eastern, western and northwestern chambers was replaced by finely dressed Mirzapur sandstone in accordance with the existing pattern. The damaged and pulverized stucco-plaster in lime-plaster was reproduced on the eastern facade of second gateway after carefully removing the decayed plaster. Staircase leading to roof-terrace in the first gateway was provided with iron grill gate in matching design at four points for the safety of visitors.

In the facade of eastern gateway and its flanking wings, the missing stucco-work was reproduced and was toned in existing shade.

The galleries of middle floor of the main chamber of the *baoli* were taken up for conservation by way of moulding and plain lime-plaster.

186. ASAFI MOSQUE, LUCKNOW, DISTRICT LUCKNOW.— The lime-plaster fallen from southern dome was restored with lime-mortar in six to eight successive coatings which were retained with the help of iron dowels having mouldings and inverted waterleaf design on the dome matching the original.

187. DIANAT-UD-DAULA'S KARBALA, LUCKNOW, DISTRICT LUCKNOW.— The pulverized lime-concrete on the central high roof and also on the roof of the four side galleries was replaced by fresh lime-concrete after removing the old one to check leakage of rain-water as also to protect the paintings. The decayed plaster having carvings and mouldings on four side facades of high rise middle structure was reproduced in matching shade with lime-mortar after removing the peeled off plaster.

188. NASIR-UD-DIN HAIDER'S KARBALA, LUCKNOW, DISTRICT LUCKNOW.— After filling up the cavities with *lakhauri* brick-work, the damaged lime-plaster was reproduced matching the existing pattern on a part of eastern facade.

189. MUSHEERZADI'S TOMB, LUCKNOW, DISTRICT LUCKNOW.—The basement of Musheerzadi's tomb was provided with iron grill ventilators replacing the later addition of modern brick-work, in order to provide adequate air and light inside the basement. The floors were provided with lime-concrete. Lime-concrete apron around the tomb was provided to strengthen the structure.

190. DILKUSHA PALACE, LUCKNOW, DISTRICT LUCKNOW.— Repairs to the building facing south side were completed by way of pointing, crack-filling and underpinning in lime-mortar wherever required. On the main gate and the side walls, the brick-tile pattern plaster was reproduced matching the original. The *chajjas* over the main gate, parapet-walls, etc., were restored by reproducing floral and carved designs in the original pattern.

191. SIKANDER BAGH GATE, LUCKNOW, DISTRICT LUCKNOW.— The compound-wall towards Ashok Marg was completed matching the original pattern of fortification-wall.

192. NADAN MAHAL, LUCKNOW, DISTRICT LUCKNOW.— The repair of graves inside the complex was undertaken. The platforms were also repaired by way of cement-concrete and lime-plaster. The damaged boundary-wall near the garden office on the north side was also restored by modern brick-work.

193. PALACE-COMPLEX, GANWARIA, DISTRICT SIDDHARTH NAGAR.— The walls of the palace-complex were strengthened by way of pointing, underpinning and water-tightening the top courses. The work is in progress.

Madras Circle

KERALA

194. MATTANCHERRY PALACE, COCHIN, DISTRICT ERNAKULAM.— The decayed wooden joists and planks of the roof-system of ground floor and supporting the flooring of the Gallery 5 of the Site Museum located in the first floor of the structure were replaced with new teakwood ones matching the original form and size. The original earthen floor of the Gallery 5 was relaid by providing a layer of sand-cusion and a brick-jelly layer over it. The floor was finished with a fine cement-mortar matching the original in colour so as to take the wear and tear due to heavy movement of visitors.

195. FORT ST. ANGELO, KANNUR, DISTRICT KANNUR.— The collapsed rampart on the northeastern corner of the fortification was reconstructed as per the original. The inner wall-surface of one of the barracks situated within the fortification was replastered in lime-mortar after raking out the dead plaster.

196. BEKAL FORT, PALLIKERE, DISTRICT KANNUR.— The structures exposed in the previous year were consolidated in matching masonry. The fallen portion of the fortification near the entrance of the fort was reconstructed as per the original.

197. NETRIMANGALAM SIVA TEMPLE, PATTAMBI, DISTRICT PALAKKAD.— The missing portion of the *prakara-wall* on the east and the southeastern corner was reconstructed as per the original.

198. SIVA TEMPLE, EYYAL (CHEMMANTHITTA), DISTRICT THRISSUR.— The decayed wooden members of the roof of the second and third floors of the granary were replaced with new teakwood members matching the original form and size. The walls were replastered after raking out the dead plaster.

199. FORT, ANJENGO, DISTRICT THIRUVANATHAPURAM.— The archaeological area was fenced.

200. JAINA TEMPLE, KITANGANAD, DISTRICT WYNAD.— A stone apron was laid all around the main shrine to protect the foundation from seepage of storm-water.

TAMIL NADU

201. JVARAHARESVARA TEMPLE, KANCHIPURAM, DISTRICT CHENGALPATTU-M.G.R.— The *gopura* over the main entrance, leaky due to decayed plaster over the brick masonry and cracks therein was rendered water-tight by replastering the exterior with a layer of combination mortar

topped with a layer of finely ground lime-mortar after the cracks and voids were suitably grouted and filled with mortar. In the process, the stucco figures were also consolidated and mended as per the original.

202. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHENGALPATTU-M.G.R. The southernmost *devakulika* located outside the *prakara* of this temple was found in a dilapidated condition due to poor quality of sandstone used in its construction. So much so, the members of the *adhishthana* courses were found to be highly weathered, a lintel and roof-slabs were cracked, leading the *tala* members out-of-plumb. Further, the joints of the masonry were widened due to weathering of sandstone. The whole structure was carefully dismantled after documentation and reconstructed to plumb as per the original after replacing the worn-out, uncarved members with new ones matching the original form and size. The cracked members were mended using non-magnetic stainless steel ; dowels. The joints of masonry were pointed matching the original texture and colour.

203. SHORE TEMPLE-COMPLEX, MAMALLAPURAM, DISTRICT CHENGALPATTU-M.G.R.—Further clearance of sand in the area, south of the main shrine was done to uncover the structural remains resulting in the exposure of the bathing *ghat-like* structure beyond the protected area. A dry masonry revetment-wall was constructed to the exposed section.

204. MUNKUDUMISVARA TEMPLE, P.V. KALATHUR, DISTRICT CHENGALPATTU-M.G.R.— In continuation of the work executed in the last season *(1993-94,* p. 181), the missing western portion of the closed *prakara* around the *Amman* shrine was reconstructed as per the original with new members.

205. DUTCH FORT AND CEMETERY, SADRAS, DISTRICT CHENGALPATTU-M.G.R.— The dilapidated and fallen northern portion of the fort-wall was reconstructed in the matching brick masonry to height lower than the extant portion. The reconstruction was to prevent the entry of catties, misuse of the premises by villagers and to maintain the monument in proper condition.

206. TIRUPULISVARA TEMPLE, VAYALUR, DISTRICT CHENGALPATTU-M.G.R.— In continuation of the last year's work *(1993-94,* p. 182), the reconstruction of the *maha-mandapa* and *mukha-mandapa* of the main shrine was completed. The former was reconstructed upto *the prastara* level and the latter to the available height of the plinth. A stone flooring was provided to the *mukha-mandapa* as per the original.

207. JALAKANTESVARA TEMPLE, VELLORE, DISTRICT NORTH ARCOT-AMBEDKAR.— The missing portion of the pillared *mukha-mandapa* and the closed *prakara* around the *Amman* shrine was reconstructed by providing new architectural members. The roof was rendered water-tight.

208. SUGRIVESVARA TEMPLE, SIRCARPERIYAPALAYAM, DISTRICT PERIYAR.— The out-of-plumb wall of the *maha-mandapa* of the main shrine was dismantled after documentation. The same was reconstructed as per the original to plumb over a new foundation upto the *prastara* level. The work is in progress.

209. MINAKSHI SUNDARESVARAR TEMPLE, AMMANKURICH1, DISTRICT PUDUKKOTAI.- The northern portion of the *pillaied-mandapa* located in front of the *mahadvara* was found to be sunken all over. The same was dismantled and reset to plumb as per the original.

210. SIVA TEMPLE, ARIYUR, DISTRICT PUDUKKOTTAI.— Located adjacent to a big tank, like other monuments of the region, this temple too had similar problems *viz.,* erosion of earth from the tank bund and its deposition within the temple-complex, high growth of vegetation resulting in dislodgement of architectural members from their position and subsidence of foundation due to high variation in the water-table level. The degree of dilapidation was compounded by long period of neglect. In the effort to bring the monument to its original condition, the whole area was cleared of thick jungle and rank vegetation growth over the monument (pl.LXX). Further, earth-work was done to bring out the original level. A revetment-wall was constructed against the bund to prevent further erosion of earth. The work is still in progress.

211. SIKHANATHASVAMI TEMPLE, KUDUMIYANMALAI, DISTRICT PUDUKKOTTAI.— The brick *sikhara* of the main shrine was rendered water-tight by replastering the whole surface with a layer of combination mortar topped with another layer of well-ground fine lime-plaster after consolidating the brick-work and grouting the cracks with mortar. In the process, the stucco figures were also mended as per the original.

212. TIRUPERUMANANDAR TEMPLE (MADATHUKOIL), NANGUPATTI, DISTRICT PUDUKKOTTAI.— The *vasanta-mandapa* located abutting the outer *prakara-wall* had collapsed completely due to inherent weakness, growth of vegetation and long neglect in the past. The collapsed debris was cleared to obtain the original architectural members. The whole *mandapa* together with a portion of the *prakara* was reconstructed as per the original (pl.LXXI) with the retrieved architectural members and new ones. The roof was rendered water-tight.

213. SIVA TEMPLE, IRUMBANADU, DISTRICT PUDUKKOTTAI.— Like other monuments in the region, this unique apsidal temple is also located below the embankment of a tank and therefore, afflicted with similar problems like erosion and deposition of the earth, high growth of vegetation, subsidence of foundation due to high water-table and long neglect over the centuries. As a result, the temple had dilapidated considerably, so much so, the *adhishthana* mouldings were covered with earth, the architectural members, particularly *ihz pada* portion, were dislodged from their position. As an initial measure to restore the temple, earth-work was done to expose the original working level (pl.LXXII). A stone revetment was constructed against the embankment of the tank.

214. FORT, ATTUR, DISTRICT SALEM.— One of the collapsed bastion was reconstructed as per the original.

215. NITISVARASVAMI TEMPLE, SRIMUSHNAM, DISTRICT SOUTH ARCOT.— The sunken pillared *mukha-mandapa* of the main shrine was dismantled and reconstructed to plumb as per the original. The *kapota* was also restored.

216. SIVAGANGA LITTLE FORT,THANJAVUR, DISTRICTTHANJAVUR.— The missing brick-masonry coping wall over the revetment-wall of the Sivaganga tank was reconstructed as per the original.

217. KRISHNA TEMPLE, KRISHNAGIRI, FORT, GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— The buttress-walls built against the walls of the main shrine were removed after consolidating and grouting the cracks in the masonry. Similar buttress-walls built to support the

broken beams and other accretionary walls built across the pillars in the pillared front *mandapa* were removed after the broken beams were strengthened and mended using epoxy resin and iron clamps (pl.LXXIII). The roof was rendered water-tight.

218. DURBAR HALL, KRISHNAGIRI FORT, GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— The inner wall surface was replastered with lime-mortar. One of the broken projected windows of this pavilion was restored.

219. PATTABHIRAMA TEMPLE, NARASINGARAYANPETTAI, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— The missing members of the *adhishthana* of the *mukha-mandapa* of the main shrine were freshly provided, matching the original form and material. Similar repair was done to the *adhishthana* course of the *kalyana-mandapa* apart from mending a broken beam.

220. RAJAGIRI FORT, GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— The facade of the western inner row of the so-called Horse Stables was restored by replastering the whole surface in combination mortar after mending the *chhajja* moulding and grouting the cracks developed in the ceiling. Similarly, fallen ceilings of the verandah of first three cells of the western outer row were also restored.

Mini Circle

GOA

221. SAFA MASJID, PONDA, GOA.— The decayed wooden beams and rafters of Safa Masjid were replaced with new ones, after treating them with wood preservatives. The interior portion was painted with Oil Bound Distemper (OBD) and the external with snowcem.

222. BASILICA OF BOM JESUS, VELHA GOA.— The main hall of the Basilica of Bom Jesus had developed three vertical cracks which were repaired by inserting I-girder at two places after treating it with epoxy in order to stop any corrosion. The other cracks were stitched with copper dowels, epoxy and araldite. Different interior portions of the church were painted with snowcem, acrylic emulsion and OBD as the paint had peeled off at many places.

The quadrangle and the Art Gallery were also white-washed. The windows and doors were painted with synthetic enamel paint.

The quadrangle wooden ceiling that had decayed at many places were repaired and some of them were replaced. Outside the Basilica proper, the drainage which was choked due to the deposit of earth was cleaned for the smooth flow of water.

223. SE' CATHEDRAL, VELHA GOA.— The exterior walls of the church was patch plastered. The foundation was strengthened by providing concrete apron. Gutters with proper slope was dug all along the apron so that the water is disposed off immediately without effecting the foundation.

224. ARCHAEOLOGICAL MUSEUM, VELHA GOA.— The roof of Gallery 8 of the Museum which was not draining off rain-water as the slope was not proper, was dismantled and re-erected by providing proper slope. Interior portion of the Museum was painted with OBD.

225. ST. FRANCIS ASSISI CHURCH, VELHA GOA .— The interior of the church was strengthened by removing the dead plaster and applying the fresh ones. Decayed window shutters were also replaced by the new ones.

Srinagar Circle

JAMMU AND KASHMIR

226. SUN TEMPLE (MARTAND), RANBIRPURA, DISTRICT ANANTNAG.— The damaged and old barbed-wire fencing was removed and refixed with fresh barbed-wire with G.I. staples.

227. PRATAPASVAMI TEMPLE, TAPPAR, DISTRICT BARAMULLA.— The damaged barbed-wire fencing was repaired and fixed with G.I. staples.

228. SUGENDESHA TEMPLE, PATTAN, DISTRICT BARAMULLA.— The old damaged barbed-wire fencing was dismantled and unserviceable material disposed off. The area around was provided with new barbed-wire fencing with G.I. staples fixed with angle iron-posts.

229. FORT, AKHNOOR, DISTRICT JAMMU.— The work of providing buttress-wall in random rubble-stone and brick masonry on the back side of the Sheesh Mahal-complex is in progress. Arches of the main entrance of the fort was also taken up for repairs and restoration.

230. SIVA TEMPLE, BILLAWAR, DISTRICT KATHUA.— The platform of the temple was exposed after removing accumulated debris and the restoration of the same is in progress.

231. BUDDHIST MONASTERY, ALCHI, DISTRICT LEH.— The dilapidated compound-wall of the monastery was taken up for repairs and is still in progress.

232. BUDDHIST MONASTERY, PHIYANG, DISTRICT LEH.— The work of providing buttress-wall and repairing of the retaining wall of the temple is in progress.

233. LEH PALACE, LEH, DISTRICT LEH.— Bulged-out mud-brick wall of Lhakhang was dismantled and restored with new bricks. The top of the Lhakhang was water-tightened. The circumambulatory-passage was repaired. Skylight and ornamental wood-work of Lhakhang were also repaired.

234. BUDDHIST MONASTERIES, LAMAYURU, DISTRICT LEH.— The pathway of the *parikrama* of the monastery was provided with stone pitching over concrete base. The steps on north-east and north-west corners were repaired. Side walls on the north side of the monastery were also restored.

235. ANCIENT STUPA AT TISSERU, DISTRICT LEH.— Sun-dried mud-brick retaining wall at third level on south side was restored. The steps on the west side at second level were repaired. The top of the retaining wall on south and east sides at fourth level were water-tightened.

236. BUDDHIST MONASTERIES, THICKSEY, DISTRICT LEH.— The work of laying wooden flooring over base concrete of the Dukhan Karmo is in progress.

237. SHEY PALACE, SHEY, DISTRICT LEH.— The roof-top of the shrine was water-tightened. The steps and the circumambulatory-passage were repaired. The old and decayed plaster was removed and replastered.

238. FORT, RAMNAGAR, DISTRICT UDHAMPUR.— The out-of-plumb stone masonry on south west bastion of the fort was dismantled and reconstructed as per the original. The cracked portions of the fortification-wall on southern side were stitched and pointed.

239. NAWA MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.— The wooden ceiling was given a coating of varnish as preservative.

240. PURANA MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.— The area around was fenced with barbed-wire over dwarf-wall. The construction of Chowkidar's quarter is in progress.

241. SHEESH MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.— Besides water-tightening the roof top, the side walls of the rooms were plastered after removing the decayed plaster. The retaining wall and platform of the first terrace was restored. In addition to a buttress-wall on the eastern side and drains on the back side, flooring of the Diwan-i-Am as per the original were also provided.

242. KALA DERA TEMPLE, MANWAL, DISTRICT UDHAMPUR.— The construction of retaining wall on north side is in progress.

243. AVANTISVAMIN TEMPLE, AVANTIPURA, DISTRICT PULWAMA.— The damaged barbed-wire fencing was removed and fixed with fresh barbed-wire with G.I. staples.

244. AVANTISVARA TEMPLE, AVANTIPURA, DISTRICT PULWAMA.— The damaged pillars, drains and dwarf-wall were repaired.

245. TOMB OFZAIN-UL-ABDIN'S MOTHER, ZAINA KADAL, DISTRICT SRINAGAR.— M.S. grill was fixed to the windows and door. Weathered portions of the dome were dismantled and restored. The cracks of the dome were also stitched to stop percolation of water.

Vadodara Circle

DAMAN AND DIU

246. FORT-WALL, MOTI DAMAN, DISTRICT DAMAN.— The work of dismantling out-of-plumb ashlar stone-masonry and providing the new ones along with other items of work like underpinning, pointing and plastering was completed.

247. HOLY JESUS CHURCH, MOTI DAMAN, DISTRICT DAMAN.— The work of replacing leaking manglore tiled-roof, battons and rafters with new ones and repairs to the doors and the windows and oil painting and colour wash etc. were completed.

248. ST. PAUL CHURCH, DIU, DISTRICT DIU.— The leaking-roof of the church was replaced.

GUJARAT

249. MALIK ALAM MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD.— In continuation of the previous year's work *(1993-94,* p. 187), the remaining works of removing the dead lime-concrete, fixing of paved stone and providing new *stone-jali* in place of missing and broken ones as per the original were completed.

250. HOUSE OF MAHATMA GANDHI, PORBANDER, DISTRICT JUNAGADH.— The work of dismantling the decayed wooden rafters and repairs to the doors, windows, staircases, removal of dead lime-mortar and providing new ones as per the original, plastering the walls in lime-cement mortar were taken up.

251. RAO LAKHA CHHATRI, BHUJ, DISTRICT KACHCHH.— The worn-out ashlar stone-masonry was dismantled and new masonry was provided to pillars, *kumbhai,* etc.

252. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.— In continuation of the last year's work *(1993-94,* p. 187), the reconstruction of ashlar stone-masonry and replacement of old weathered corbelled intrados of dome were completed.

253. MAKAI KOTHAR, PAVAGADH, DISTRICT PANCHMAHALS.— The work of resetting ashlar stone-masonry and RR masonry was done after dismantling the dead mortar and providing RR masonry in place of missing ones (pl.LXXIV).

254. CITADEL WALL, PAVAGADH, DISTRICT PANCHMAHALS.— The work of dismantling out-of-plumb ashlar stone-masonry and resetting the same including RR masonry in place of missing ones were completed.

255. GROUP OF TEMPLES, KHED RODA, DISTRICT SABARKANTHA.— The works of removing and resetting ashlar stone-flooring including providing the missing ones were carried out.

256. NAVLAKHA TEMPLE, SEJAKPUR, DISTRICT SURENDRANAGAR.— In continuation of the previous year's work *(1993-94,* p. 187), the dressing and moulding of stones as per the original pattern for plinth masonry, were undertaken.

257. HAZIRA, VADODARA, DISTRICT VADODARA.— The work of dressing and carving of Dhangadra stone for *stone-jali* as per the original was completed.

MONUMENTS MAINTAINED BY THE STATES

ANDHRA PRADESH

The Directorate of Archaeology and Museums, Government of Andhra Pradesh, carried out conservation of the following monuments.

258. TOMB OF MONS, RAYMONDS, ASMANGADH, DISTRICT HYDERABAD.— The height of the . compound-wall was raised.

259. MEGALITHIC BURIALS, HASHMATPET, DISTRICT HYDERABAD.—The height of the compound-wall was further raised to safeguard the burials.

260. QUTB SHAHI MOSQUE, KOMATUR, DISTRICT MEDAK.— The repairs to the mosque were taken up.

ASSAM

The Directorate of Archaeology, Government of Assam, carried out conservation work at the following Monuments.

261. GHUGUA DOL, DISTRICT DHEMAJI.— The work of eradication of vegetation was attended to by using chemicals. The damaged part was plastered.

262. MOTHEJHAR TEMPLE RUINS, DISTRICT DHUBRI.— The site was provided with goat proof fencing, gate and cattle trap.

263. RAIDANGIA DOL, DISTRICT DIBRUGARH.— The roof of the *mandapa* was reconstructed and the repair works, wherever required, were attended to.

264. CHATRAKAR DEVALAYA, DISTRICT KAMRUP.— Lime-surkhi-plaster was applied on the affected area of the temple and inside the temple.

265. BASUDEVA DOL, DISTRICT LAKHIMPUR.— The monument was provided with an apron.

266. RUDRESVARA DEVALAYA, DISTRICT KAMRUP.— The area around was provided with M.S. grill.

267. MANIKARNESVARA DEVALAYA, NORTH GUWAHATI, DISTRICT KAMRUP.— The surrounding of the monument which was full of jungles etc., was cleared. An approach road to the monument was constructed with stone-masonry work.

268. BAGHAR-CHUKOR DOL, DISTRICT LAKHIMPUR.— The vegetational growths were removed.

269. CHARAIDEO ARCHAEOLOGICAL PARK, DISTRICT SIBSAGAR.— This Maidam-based site was cleared off vegetations, and the gates, railings etc., were painted.

HARYANA

The conservation work was carried out by the Department of Archaeology, Government of Haryana, at the following Monuments.

270. CHATTA RAI BAL MUKUND DASS, NARNAUL, DISTRICT MAHENDRAGARH.

271. BUDDHIST STUPA, KURUKSHETRA, DISTRICT KURUKSHETRA.

272. SHISH MAHAL, FARUKHNAGAR, DISTRICT GURGAON.

KARNATAKA

273. BANGALORE MUSEUM, DISTRICT BANGALORE.

274. MANTAPAS AT THER BAZAR, HAMPI, DISTRICT BELLARY.

275. HISTORICAL FORT OF BASAVAKALYANA, DISTRICT BIDAR.

276. SRI DURGAPARAMESVARI TEMPLE, HIREMOSALE, DISTRICT BIJAPUR.

277. SRI NARASIMHASVAMY TEMPLE, SIBI, DISTRICT CHITRADURGA.

278. RAGAIAHNA HEBBAGILU, CHITRADURGA, DISTRICT CHITRADURGA.

279. MUD PALACE, SURALU, DISTRICT DAKSHINA KANNADA.

280. SRI VIRABHADRESVARASVAMY TEMPLE, GULUR, DISTRICT KOLAR.

281. CHANDRAMOULESVARASVAMY TEMPLE, BAGEPALLI, DISTRICT KOLAR.

282. SRI ANANTHAPADMANABHASVAMY TEMPLE, BUDANPUR, DISTRICT MANDYA.

283. SRI BRAHMESVARA TEMPLE, KIKKERI, DISTRICT MANDYA.

284. SRIRANGAPATNA FORT, SRIRANGAPATNA, DISTRICT MANDYA.

285. SRI VENUGOPALASVAMY TEMPLE, TONNUR, DISTRICT MANDYA.

286. MUSEUM, DISTRICT MERCARA.

287. SRI SHANTHINATHABASTI, CHIKKAHANASOGE, DISTRICT MYSORE.

288. SRI LAKSHMINARASIMHASVAMY TEMPLE, KALALE, DISTRICT MYSORE.

289. SRI CHAMUNDESVARI TEMPLE, CHAMUNDI HILL, MYSORE, DISTRICT MYSORE.

290. SRI MALLIKARJUNASVAMY TEMPLE, MUDUKUTHORE, DISTRICT MYSORE.

291. SRI SEETHARAMANJANEYASVAMY TEMPLE, MYSORE, DISTRICT MYSORE.

292. SRI LAKSHMINARASIMHASVAMY TEMPLE, BHADRAVATHI, DISTRICT SHIMOGA.

293. DHARANATHESVARA TEMPLE, DHARANATH, DISTRICT UTTARA KANNADA.

MANIPUR

294. THANGAL TEMPLE, DISTRICT IMPHAL.— At a palace compound, the Department of Archaeology, Government of Manipur, provided apron for giving protection to the plinth of the temple.

RAJASTHAN

295. AKBAR'S FORT, DISTRICT AIMER.— Main gate and upper windows *(jharokhas)* were colour painted by the Department of Archaeology and Museums, Government of Rajasthan.

X. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS'

ANDHRA PRADESH

1. VIRABHADRA SVAMY TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—The removal of superficial dust, dirt, bird's excreta and soot deposits from the painted surface in *ardha-mandapa* was taken up using mild solvents and chemicals *viz.,* triethanolamine, diacetone, alcohol, methanol, isobutyl alcohol, etc. Filleting work was also attended to wherever required and the entire treated area was finally preserved with 1-2% solution of poly vinyl acetate in toluene.

The hardened vegetational accretions were removed from the painted surface of *Somavara mandapa* using carboxymethyl cellulose/ammonium carbonate in methanol applied on whatman paper. After careful removal of the accretions, painted plastered surface was thoroughly cleaned with toluene and diacetone alcohol. Finally a coat of 2% solution of PVA was given as preservative.

2. ARCHAEOLOGICAL MUSEUM, CHANDRAGIRI, DISTRICT CHITTOOR.— The work of chemical treatment and preservation of stone sculptures and metal antiquities was continued and 18 sq meter area of stone sculptures and three bronze objects were treated and preserved (pi. LXXV).

3. SHREE PARASURAMESVARA SVAMY TEMPLE, GUDIMALLAM, DISTRICT CHITTOOR.— The thick growth of micro-vegetation and lime deposit hiding the fine inscriptions on the granite stone surface of the temple were removed by chemical treatment with the help of teepol and mild ammonical solution whereas calcareous deposits were removed by chemico-mechanical method using dilute acetic acid. The treated area was given fungicidal treatment followed by a preservative coat on the dry surface.

- 4. SHREE BHIMESVARA SVAMY TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI.— The exterior surface of this temple was chemically treated for the removal of accumulated dust, dirt, sooty and oily matter apart from vegetational growth using non-ionic detergent and mild base. The patches of lime deposits wherever noticed were removed with dilute acetic acid. The treated area after thorough washing was given fungicidal treatment followed by a preservative coat on the given dry surface.

5. GOLCONDA FORT, HYDERABAD, DISTRICT HYDERABAD.—Iron doors of the fort were subjected to chemical treatment in order to remove marks of rust and paint by local application of suitable chemicals. Wooden doors, beam and rafters were also fumigated to get rid of insects and finally the cavities/holes were filled with saw dust and fevicol emulsion.

'Information from: Director (Science), of the Chemical Branch of the Survey.

6. KUDALISANGAMESVARA TEMPLE, ALAMPUR, DISTRICT MAHABOOBNAGAR.— Oil paint and accumulated calcareous accretions on the exterior and interior surfaces were removed by physico-chemical means with the selective use of chemicals. Vegetational growth was also removed with the help of dilute teepol-ammonia solution. The entire cleaned area was preserved with 3% Acrypol-P after fungicidal treatment.

7. SVARGA BRAHMA TEMPLE, ALAMPUR, DISTRICT MAHABOOBNAGAR.—The cleaning of patches of thick lime deposits and vegetational growth on this temple was taken up using dilute acetic acid and mixture of dilute ammonia and teepol respectively. The entire cleaned and thoroughly washed surface was given fungicidal treatment and finally preserved with 3% solution of Acrypol in toluene.

8. THOUSAND-PILLARED TEMPLE, HANAMKONDA, DISTRICT WARANGAL.—Accretionary deposits of lime, dust and dirt on the exterior walls of the temple were removed by chemical treatment. Lime patches were removed with the help of dilute acetic acid and other accretionary deposits with dilute ammonia solution and soft brushing. Entire cleaned surface after thorough washing was given fungicidal treatment followed by a preservative coat of polymethyl methacrylate.

BIHAR

9. EXCAVATED SITE, NALANDA, DISTRICT NALANDA.— Temple 3 including stucco figures were chemically cleaned with the help of dilute solution of ammonia and non-ionic detergent using soft nylon brushes. Cleaned area was given fungicidal treatment of 3% solution of sodium pentachlorophenate followed by 3% solution of acrylic emulsion and finally preserved with 3% solution of polymethyl methacrylate in toluene.

10. MEER ASHRAF KHAN JAMA MASJID, PATNA, DISTRICT PATNA.— Replastered surface of the masjid was chemically preserved with the application of 3-4% solution of santobrite as a fungicide followed by a coat of 3 % solution of polymethyl methacrylate in toluene on the complete dry surface.

11. HASAN SHAH SURI TOMB, SASARAM, DISTRICT ROHTAS.— The stone surface and plastered area of the tomb were subjected to chemical treatment for the removal of vegetational growth, dust and dirt. Aqueous solution of ammonia and teepol, used for softening thick and hard accretions were subsequently removed with gentle nylon brushing. Entire cleaned area was given fungicidal treatment with 3% aqueous solution of sodium pentachlorophenate followed by a preservative coat of 3% polymethyl methacrylate in toluene.

DAMAN AND Diu

12. FORT-WALLS, Man DAMAN, DISTRICT DAMAN.— The eradication of micro-vegetational growth and other accretionary deposits from the fort-walls was continued with the help of dilute solution of ammonia and teepol mixture followed by fungicidal treatment with 2% aqueous suspension of zinc silicofluoride and finally it was preserved with 3% solution of polymethyl methacrylate in toluene.

DELHI

13. RED FORT, DELHI, DISTRICT DELHI.— The removal of accretionary deposits of dirt, dust and greasy matter on the exterior sides on the east, north, south and burgies of Diwan-i-Khas was taken up with the help of dilute aqueous mixture of ammonia and teepol using cotton swabs only. Cleaning of marble with inlay-work was carried out with the help of bentonite clay-pack. Organic solvents were also used wherever required for the removal of oily/greasy deposits. The work is in progress.

Paintings executed on the fibrous material and fixed on the wooden ceiling of the Diwan-i-Khas have suffered significant physical damage besides accumulation of dust, dirt and sooty matter. Apart from this, the fibrous material at places is found to be looseiy hanging having detached from the wooden support. The chemical conservation measures were initiated to preserve the paintings on the southwestern corner of the ceiling by consolidating the fragile cracked painted areas with bees wax impregnation using hot spatula. The detached fibrous support was re-fixed to the wooden ceiling using animal glue to which sodium pentachlorophenate was added to prevent the microbes infection. Old darkened preservative coat and other accretionary deposits were removed with the help of methyl alcohol. While consolidating the painted surface, tissue paper was used to keep the pigment layer intact. The lacunae were filled with a paste prepared from kaolin, zinc oxide and animal glue with above fungicide. The work is in progress.

The marble surface of Shah Burj on the eastern side was subjected to chemical treatment for the removal of accumulated dust, dirt, sooty and greasy material and the marble surface decorated with inlay-work was cleaned by clay-pack technique using bentonite. The remnants of greasy/oily deposits along with scribblings were also removed with the help of organic solvents. The work is in progress.

Three sides of the rampart under flagmast and two burgies were subjected to chemical treatment with mild solution of ammonia and non-ionic detergent. After fungicidal treatment, preservative coat was applied on the completely dried surface.

In continuation of the last year's *(1993-94,* p. 191) work, the chemical treatment was carried out for the removal of accumulated accretionary deposit of dust, dirt, greasy matter, lime and bird's droppings from the stone surface on the southern side and the central portion of the hall. Loose accretionary deposits were removed by soft brushing while the adherent calcareous and greasy/oily deposits were removed with the use of dilute acetic acid and mixture of dilute ammonia solution and teepol. The chemically cleaned area was preserved with 3% solution of polymethyl methacrylate in toluene.

14. HUMAYUN'S TOMB, NIZAMUDDIN, NEW DELHI.— The removal of accretionary deposits of vegetational growth, dust, dirt and stains of beehives on the eastern wall was continued with the help of dilute solution of ammonia and teepol mixture while hydrogen peroxide and petroleum ether were specifically used for the removal of stains and wax spots. The entire cleaned area was given fungicidal treatment with 2% sodium pentachlorophenate followed by a preservative coat of 3% polymethyl methacrylate in toluene. The work was completed.

15. LAL BANGLA, DELHI GOLF CLUB, NEW DELHI.— The work of chemical treatment and preservation was carried out on the two tombs near the entrance of Delhi Golf Club. Accretionary deposits along with vegetational growth on red sandstone surface were removed with the help of aqueous ammonia and teepol with mild nylon brushing. Calcareous accretions were removed by the application of dilute acetic acid. The cleaned area was finally preserved with 3% solution of polymethyl methacrylate in toluene after fungicidal treatment. The work is in progress.

16. QUTB COMPLEX, MEHRAULI, NEW DELHI.—The work of chemical treatment was taken up on the lower hall of the portion below the squinches on all the sides of the interior portion of Ala'i Darwaza for the removal of accretionary deposits of dust, dirt and oily matter. Ammonical solution and non-ionic detergent-teepol were used for the removal of superficial accretions with mild nylon brushing. The adherent layers of calcareous deposits were removed with dilute acetic acid and solution of sodium hexametaphosphate.

GOA

17. ARCHAEOLOGICAL MUSEUM, VELHA GOA, DISTRICT PANJIM.— The portrait paintings of Governors displayed in the museum were chemically treated for the removal of old darkened varnish using different organic solvents *viz.,* cellosolve, diacetone alcohol, iso amyl acetate, butyl lactate, morpholine etc. The gaps between the joints of wooden panels were filled with saw dust, fevicol and limited use of plaster of Paris. The colour reintegration of repaired/filled up areas was also attended to. The wooden frames and plywood backing of some portrait paintings damaged by insect activity were repaired or replaced. Insecticidal treatment was given to some polychrome sculptures and wooden objects infested with insects. Thick coat of oil bound distemper over the mural paintings was chemically removed.

18. BOM JESUS CHURCH, VELHA GOA, DISTRICT PANJIM.— The canvas/panel paintings were chemically treated in order to remove the superficial deposits of dust, dirt and darkened varnish coat. Relining patch repair and retouching were also attended to. Restoration and preservation of fifty-two wooden sculptures in the Art Gallery, infested with insect was also attended to by insecticidal treatment after removing dust, dirt and old varnish. The gaps and repairs to the insect eaten portions were consolidated with dust and fevicol. The general dusting of gilded altars, blessed sacrament and other wooden carvings was also attended to. The silver casket of the body of St. Francis Xavier, silver statues of angels, statue of Fransis Xavier, were also chemically cleaned and preserved. The marble platform on which the body rests was also chemically cleaned and preserved.

19. LADY ROSARY CHURCH, VELHA GOA, DISTRICT PANJIM.— There are two big and two small altars. Of the two bigger altars, one is badly infested with insect activity. These wooden altars were given insecticidal treatment. The panel paintings in the small altars, polychrome sculptures and marble work were also chemically treated and preserved.

20. ST. CAJETAN CHURCH, VELHA GOA, DISTRICT PANJIM.— The main and the four small gilded altars were cleaned with the help of feather brushes and sable hair brushes. Four canvas and ten panel paintings and polychrome sculptures were chemically treated, colour matched and preserved. The

stone sculptures outside the church were chemically cleaned for the removal of distemper droppings. The moss and lichen on the stone surface of Adil S.ahi gate was chemically treated and preserved.

21. SE-CATHEDRAL CHURCH, VELHA GOA, DISTRICT PANJIM.— Dusting, chemical cleaning and burnishing of gilded altars were continued on the upper portion of main altar for the removal of given patina. Insecticidal treatment was given to the back side of the main wooden altar. The panace as well as canvas paintings, fixed in different gilded altars and murals of the church, were chemically cleaned and preserved along with the stone work at the entrance.

22. ST. FRANSIS ASSISI CHURCH, VELHA GOA, DISTRICT PANJIM.— General cleaning and burnishing work of the altar and the side chapels were attended to in addition to the preservation of panel/canvas paintings. Polychrome sculptures were also repaired by filling the cracks and fissures with saw dust and fevicol and finally colour matched. The work is in progress.

23. VICEROY GATE, VELHA GOA, DISTRICT PANJIM.— Laterite wall surface and stone sculptures of the Viceroy Gate was chemically treated with dilute ammonical solution and non-ionic detergent for easy removal of dust, dirt and vegetational growth by soft nylon brushing. Fungicidal treatment was given on the cleaned and thoroughly washed surface followed by a preservative coat of polymethyl methacrylate on dry surface.

GUJARAT

24. MAHATMA GANDHI'S BIRTH PLACE, PORBANDAR, DISTRICT JUNAGADH.— Wall paintings, covered under lime wash were exposed with the help of chemical treatment using suitable chemicals and solvents. The exposed paintings were preserved with 2% polyvinyl acetate.

25. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.— Stone sculptures and ornamental carvings (pl.LXXVI) of steps (4 to 7) were chemically treated for eradicating thick growth of moss and lichen using dilute mixture of non-ionic detergent and ammonia. The cleaned area after fungicidal treatment was preserved with 2% polymethyl methacrylate in toluene.

26. CITADEL WALLS, CHAMPANER, DISTRICT PANCHMAHAL.—The Citadel walls were chemically treated (pl.LXXVII) with suitable mild chemicals *viz.,* dilute ammonia, teepol and acetic acid solution to facilitate the removal of micro-vegetation and lime accretions respectively. The cleaned surface was given fungicidal treatment and finally preserved with 2% polymethyl methacrylate in toluene.

27. HEERA BHAGOL, DABHOI, DISTRICT VADODARA.— The chemical treatment of the monument was carried out for removing the biological growth and patches of lime wash. The entire surface was given fungicidal treatment and finally preserved with 2% polymethyl methacrylate in toluene.

28. VADODARA BHAGOL, DABHOI, DISTRICT VADODARA.— Thick growth of moss and lichen on stone surface was removed with the help of aqueous solution of ammonia and teepol detergent. The cleaned surface was given the fungicidal treatment and finally preserved with 3% polymethyl methacrylate in toluene.

HIMACHAL PRADESH

29. LAXMINARAYANA GROUP OF TEMPLES, CHAMBA, DISTRICT CHAMBA.— Deposition of lime plaster and growth of moss and lichen concealing the details of carvings of Trimukheshvara temple were removed chemico-mechanically by using dilute acetic acid solution and ammonia teepol mixture respectively. 1 % zinc silicofluoride suspension was sprayed on the cleaned area as fungicide and finally 2% solution of polymethyl methacrylate acetate in toluene was applied as a preservative coat.

30. BASHESVAR (VASESAR) MAHADEVA TEMPLE, BAJAURA, DISTRICT KULLU.— Thick deposits of dust, dirt and vegetational growth were removed from the exterior surface with the help of ammonical solution mixed with teepol. After thorough washing 2% suspension of zinc silicofluoride was sprayed as a fungicide and the cleaned area was finally preserved with 2% polymethyl methacrylate acetate in toluene.

31. BUDDHIST MONASTERY, TABO, DISTRICT LAHAUL AND SPITI.— The chemical treatment and preservation work of wall paintings were taken up on the western, southern and eastern half walls of the big hall of sanctum-sanctorum of Du-Khang. Due to architectural problems of the adobe structures, the mural paintings had suffered severe damage in the form of deep vertical and horizontal cracks in large number. At some places, the chunks of painted plaster were precariously hanging having detached from the support. Besides, the painted layer obliterated due to deposition of thick layers of dust, dirt and greasy matter was flaking at many places. Big chunks of mud-plaster at some places are missing completely and in a few cases, repairing in a very crude manner, was done. Due to water seepage, mud streaks with wash out effect on the colours were also responsible for damage to the painted surface.

To prevent any further physical loss or damage to the mural paintings, the restoration work as per requirement was taken up first to fill up the cracks and repair bulges and losses with the help of plaster of Paris, fibrous material and poly vinyl acetate emulsion. Frizzled and flaked painted layers were also consolidated carefully. Then the superficial deposits were removed with the help of soft brushes followed by cleaning of sooty and greasy accretions with suitable solvents and chemicals. Old preservative was also removed to improve the original tone of colours. The entire restored and cleaned area was preserved with 1.5% poly vinyl acetate solution after minor colour integration.

The stucco figures fixed on the walls covered with thick layers of dust, dirt and greasy matter and physically damaged in some cases, were taken up for mending, restoration and chemical cleaning. Broken parts were automatically matched and fixed to the respective figures. The works related to repair of fractures and strengthening of supporting bars were also attended to. Stuccos were finally chemically cleaned, mended parts were colour integrated and preserved.

JAMMU AND KASHMIR

32. SIVA TEMPLE, BILLAWAR, DISTRICT KATHUA.— Thick growth of moss and lichen from the exterior as well as oily and greasy accretions from the interior stone surface was removed by using dilute solution of ammonia and teepol mixture. After thorough' washing all the cleaned surface was

given fungicidal treatment with 2% aqueous suspension of zinc silicofluoride and finally preserved with 2% solution of polymethyl methacrylate acetate in toluene.

33. GROUP OF TEMPLES, KIRAMCHI, DISTRICT UDHAMPUR.—The outer surface of Temple 1 was subjected to chemical treatment for the removal of dust, dirt and vegetational growth, using dilute ammonical solution, mixed with teepol and mild brushing. Hard lime accretions deposited in the carvings were also removed with dilute acetic acid solution. Similarly, interior surfaces affected with sooty and greasy deposits were also cleaned. After thorough washing, the entire cleaned area was given fungicidal treatment of 2% solution of zinc silicofluoride followed by a preservative coat of 2% polymethyl methacrylate acetate in toluene on the completely dried surface.

34. SHEESH MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.— The nineteenth century mural paintings and stucco relief work in the Sheesh Mahal had suffered significantly mainly due to human vandalism and seepage of water, peeling of pigment, bulging and loss of plaster. Extensive restoration was carried out by filling the cracks, fixing the bulges and consolidating fragile and flaking portions of paintings. Superficial deposits were removed by gentle brushing followed by cleaning with selective use of suitable chemicals *viz.,* amylacetate, butyl alcohols, carbon tetrachloride, benzene, acetone, toluene, turpentine oil, etc. Finally the cleaned portions were preserved with 0.5% poly vinyl acetate in toluene.

KARNATAKA

35. BADAMI CAVES, BADAMI, DISTRICT BIJAPUR.— The removal of vegetational growth, patches of bat's excreta and lime accretions from the stone sculptures and carvings of Cave 1 was taken up by using dilute ammonia solution, teepol, and acetic acid. The work is in progress.

36. DURGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.— The chemical treatment was carried out on the north side wall and roof for eradicating micro-vegetational growth as also for removing the lime wash accretions. A mixture of ammonical solution and non-ionic detergent for removing the growth while dilute acetic acid to soften the calcareous accretions and subsequent removal were used. About 305 sq m area was chemically cleaned. The work is still in progress.

37. VIRUPAKSHA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.— Micro-vegetational growth and lime wash from the carvings and sculptures of interior and exterior surfaces were eradicated. About 452 sq m area was treated. The work is in progress.

38. CHENNAKESAVA TEMPLE, BELUR, DISTRICT HASSAN.— The stone sculptures and decorative carvings of this temple were chemically treated for the eradication of vegetational growth and oily reddish brown accretions. Dilute ammonical solution and teepol were used to soften the accretionary deposits for easy removal by mild brushing. About 1195 sq m chemically cleaned area was given fungicidal treatment of 1 % aqueous solution of sodium pentachlorophenate. The work is in progress.

39. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.— Micro-vegetational growth, ochre patches, calcareous and other accretionary deposits were removed from *nandi-mandapas* in front of Hoysalesvara and Shantalesvara shrines. About 2140 sq m area was chemically cleaned and given

fungicidal treatment of 1 % aqueous santobrite solution. The surface was allowed to dry completely and preserved with 1% Acrypol in toluene.

40. GOMATESVARA STATUE, SRAVANABELAGOLA, DISTRICT HASSAN.— After *mahamastakabhisheka* of Gomatesvara statue was observed, covered with various types of unguents including sandal paste, water, *sindoor,* etc., the chemical treatment work was carried out and approximately 1360 sq m area consisting of carvings in the adjoining *mandapas,* were chemically cleaned and preserved. Aqueous mixture of dilute ammonia solution and non-ionic detergent was used along with dilute acetic acid solution and sodium carbonate for the cleaning of ingrained accretions, as well as ochre, lime bands and enamel paint at certain locations. The entire cleaned area was given a coat of 1 % solution of santobrite as fungicide followed by a preservative coat of 1% Acrypol in toluene.

41. PANCHALINGESVARA TEMPLE, GOVINDANAHALLI, DISTRICT MANDYA.— The chemical treatment work was continued on the sculptures and carvings in the interior of the sanctums and *navaranga* of the temple. About 1225 sq m area was treated during the period under review for the cleaning of sooty and oily accretions using aqueous ammonical solution and non-ionic detergent. The lime wash coats, at some places, were treated with dilute acetic acid. The cleaned area after fungicidal treatment was preserved with 2% solution of Acrypol pellets in toluene.

42. NARAYANASVAMY TEMPLE, MELKOTE, DISTRICT MANDYA.— The eastern side of the temple was chemically treated by removing oily and sooty accretions using dilute ammonia solution mixed with teepol. Solution of glacial acetic acid was also used at certain places for the removal of lime deposits. The entire cleaned area was preserved with 1% solution of Acrypol in toluene after fungicidal treatment.

43. DARIA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.— Mural paintings (pls.LXX VIII-LXXIX) on the west wall of the eastern verandah of the monument were chemically treated for the removal of old varnish coat, superficial and ingrained accretions to improve aesthetic appearance. The colour reintegration work was also attended to wherever required and paintings were finally preserved with 1% polyvinyle acetate in toluene.

44. TIPU SULTAN'S MAUSOLEUM GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA.— In continuation of the last year's work *(1993-94,* p. 196), the superficial accretions, old translucent, brittled and yellowed varnish coat were removed. Paintings in their original colours were also exposed. Filleting, filling of lacunae and colour reintegration works were also attended to. The work is still in progress.

KERALA

45. SIVA TEMPLE, PERUVANAM, DISTRICT THRISSUR.— Chemical treatment work was taken up on the wooden structure of the temple to remove muddy, tarry and sooty accretions. Thoroughly cleaned surface was given insecticidal treatment of 1 % pyrethrum extract and finally preserved with 2% solution of polyvinyl acetate in toluene.

46. VADAKKUNATHAN TEMPLE, THRISSUR, DISTRICT THRISSUR.— Wood carvings in *namaskara mandapa* of Sri Rama shrine of the temple were subjected to chemical treatment for the removal of muddy, sooty and oily accretions, using suitable chemicals and solvents. Wooden structure was allowed to dry completely in air and later on with the use of methylated spirit. Insecticidal treatment was given by spraying 1 % solution of Flytox, a pyrethrum extract followed by a preservative coat of 2% polyvinyl acetate in toluene.

MADHYA PRADESH

47. MAHADEVA TEMPLE, PALI, DISTRICT BILASPUR.— The exterior surface of the temple badly affected by accretionary deposits of dust, dirt, bird droppings and micro-vegetational growth was subjected to chemical treatment by using liquid ammonia teepol mixture. The entire cleaned area was given fungicidal treatment and preserved with a protective coating of polymethyl methacrylate (1 %) solution in toluene.

48. GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATTARPUR.— The exterior sandstone walls of *mandapa, maha-mandapa* of Kandariya Mahadeva Temple were chemically treated for the eradication of micro-vegetational growth, with dilute ammonical solution mixed with teepol. The entire cleaned surface was given fungicidal treatment of zinc silicofluoride followed by a preservative coat of 2% polymethyl methacrylate in toluene on complete dried surface. >

The work of surface consolidation and strengthening of the badly eroded and weathered sculptures in various temples of the western group was continued. Special repairs were also undertaken to the sculptures on platform terrace wall of Lakshmana temple, which had developed cracks and had also started flaking off. The work is in progress.

The Lakshmana Temple was extensively colonised by micro-vegetational growth, obliterating the beautiful architectural work. The chemical conservation work was carried out on the north-east portion of *sikhara* to remove the accretionary growth which otherwise might cause weathering of the stone surface. Dilute ammonia solution mixed with teepol has been used along with soft brushing. The entire cleaned area has been given fungicidal treatment of zinc silicofluoride followed by a preservative coat of 1-2% polymethyl methacrylate in toluene.

49. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.— The cells in Caves 2,3 and 4 were fumigated periodically with Celphos and bromofume in order to control bat menace and insect activity. Insecticides pyrethrum and lindane were injected in the holes, cracks and crevices to arrest the insect activity. The cleaning of murals, consolidation and fixation of loose pigments were also carried out. Filleting work was also attended to wherever required.

The stone relief sculptures of Buddha, *dvarapala* and *chauri-beaier* in Cave 2 which had developed serious cracks and also suffered damage due to excessive water seepage and pulverization of the rock were repaired and restored by filling the cracks and reinforcement using stainless steel pins and epoxy resin.

The stripping of mural paintings in the cells towards south and west of Cave 2 was undertaken by de-stacco technique as a measure to save these paintings from total destruction on account of perpetual problem of increasing water seepage and copious percolation of rain water through the permeable ground rock. The stripped paintings have been mounted on the new support during the conservation workshop. An araldite epoxy resin formulations reinforced with fibre glass strands was used for mounting purpose. In case of large paintings, honey-comb shaped stainless steel mesh was incorporated in the support construction for further reinforcement.

50. HOSHANG SHAH'S TOMB, MANDU, DISTRICT DHAR.— The work of chemical treatment (pl.LXXX) for the removal of accumulated dust, dirt and other accretionary deposits from the exterior marble surface was continued and completed during the period under review. In general, dilute solution of ammonia and non-ionic detergent was used. At places thick and hard calcareous accretions were removed chemico-mechanically with the help of sodium hexametaphosphate. Organic solvents have also been used for the removal of greasy stains.

51. GHAUS MOHAMMAD'S TOMB, GWAUOR, DISTRICT GWAUOR.— The paintings on the ceiling of the main verandah and entrance of the mausoleum were restored and preserved. The work involved fixing of bulges, filleting and fixing of loose and damaged plaster, consolidation of pigments and cleaning of accretionary deposits. Paintings were finally preserved with 1-2% poly vinyl acetate in toluene. The work is in progress.

52. GWALIOR FORT, GWAUOR, DISTRICT GWAUOR.— In continuation of the last year's *(1993-94,* p. 197) work, the exterior portions of the sanctum walls facing west of Teli-ka-Mandir were chemically treated with suitable chemicals to remove accretionary deposits. After thorough washing and complete drying a preservative coat was applied. The work is still in progress.

The chemical conservation work was resumed in Cave 26 of Ek Pathar Ki Baoli, in order to remove thick lime accretions, bird's dropping, bat's excreta, etc., from the carved sandstone surface by chemico-mechanical means. The work is in progress.

53. MONUMENTS AT SANCHI, DISTRICT RAISEN.— The square sandstone railing on the flat top of the dome and eastern and southern gates of the Great Stupa, affected by heavy cryptogamous growth were chemically treated using dilute aqueous solution of ammonia and non-ionic detergent. Fungicidal treatment and preservative coats were applied to the chemically cleaned stone surface.

MAHARASHTRA

54. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.— After rectifying the surface, defects such as cracks, building, etc., the painted surface of the north wall of Cave 17 which had developed chalkiness over the years obscuring the details, was subjected to chemical treatment with the help of selected organic solvents such as methanol, n-butanol, iso-butanol, cellosolve, diacetone alcohol, amyl acetate, dimethyl formamide, morpholine, butyl lactate, butyl amine, turpentine oil, etc., in desired proportions in accordance with the demand of the situation. Later the painted surface was subjected to thorough chemical wash with petroleum spirit and methanol to remove the traces of other chemicals. The cleaned areas were preserved with 1% poly vinyl acetate in toluene. The painted

surface of the ceiling of south aisle was also chemically cleaned and preserved. Restoration of the paintings on the west wall was also carried out in order to fix bulgings, paint layer and to fill the cracks, holes etc. using poly vinyl acetate emulsion, plaster of Paris and fevicol as per requirement. The rodges on the painted layer were attended to by making it flexible with methanol and fixed back by injecting dilute synthetic emulsion.

In Cave 6 restoration and chemical treatment work of murals was carried out in the main Buddha shrine and on the south wall and ceiling of the cell in the central hall of first floor. Prior to chemical cleaning, the painted plaster was consolidated with polyvinyl acetate emulsion and by filling up the missing portions with plaster of Paris and fevicol. After stabilizing the structures for continuity, the murals were chemically treated using suitable organic solvents and chemicals to remove surface deposits and accretions. Finally, a preservative coat of 2% polyvinyl acetate in toluene has been applied to the entire restored and cleaned area.

Stains of honey bees wax inter spread with soot and dust were removed from the facade of Cave 19 using suitable solvents like chloroform, carbon tetrachloride and solvent naptha. Micro-biological growth on the sculptures and carvings of side walls were also removed with the help of soft brushing, using ammonia and teepol solution. Traces of painted plaster on the inner surface of *chaitya* window were restored and colour matched. The entire cleaned area was preserved with 2% polyvinyl acetate after fungicidal treatment. Restoration of paintings on the ceiling was also attended to by consolidating the loose plaster with polyvinyl acetate emulsion, fixing of bulges and painted surface, filling up of holes and cracks and filleting of the edges. Restored area was suitably tinted and colour matched with earth and poster colour as per requirement on the basis of colour scheme of the adjacent areas.

In Cave 9 paintings on the north and south walls were also chemically treated. In view of the tenacious nature of the accretions, the progress was very slow because of poor response of solvents and chemicals to the accretions. The entire cleaned surface was thoroughly washed with petroleum spirit and methanol and allowed to dry.

To prevent carnage to the paintings due to insect activities, 2% pyrethrum extract solution in kerosene is being used and sprayed only on unpainted surface periodically in Caves 1,2,10,16,17 and 21. The paintings under glass frame in Cave 10 were also given insecticidal treatment using paradichlorobenzene and napthalene balls as fumigant.

In order to reduce further the insects activity, Caves 1 and 2 were fumigated with ethoxide gas. The measures are being taken once in 2 and 3. years with the help of Pest Control India Ltd., Bombay.

To record variation of temperature and relative humidity in the caves due to various factors, monitoring is being done regularly using hygrometer and thermal hygrograph.

55. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—The exterior stone surface on the western side of the mosque was subjected to chemical treatment for the removal of dark black accretions of dried vegetational growth. Stucco-work of the ceiling of the mosque was also cleaned. The work is in progress.

56. CAVES, KARLE, DISTRICT PUNE.— Prior to chemical treatment, superficial dust was removed by gentle brushing of the murals. These were chemically treated by using suitable organic solvents like methyl alcohol, triethanolamine, diacetone alcohol cellosolve, ethyl acetate, butyl lactate, dibutyl phthalates morpholine, etc., or their mixture as per requirement to bring back visibility of the murals. The existing portion of the wooden umbrella structure of the cave has also been chemically cleaned and preserved. The work is in progress.

ORISSA

57. SCULPTURES, ARCHAEOLOGICAL MUSEUM, RATNAGIRI, DISTRICT CUTTACK.— The stone sculptures for display in the museum were chemically treated for the removal of superficial accretionary deposits by using dilute ammonia teepol mixture. After chemical cleaning and thorough washing, sculptures were given fungicidal treatment and finally preserved with 2% polymethyl methacrylate in toluene.

58. ROCK-SHELTERS, SITABHANJI, DISTRICT KEONJHAR.—The paintings on the ceiling of a rock-shelter were chemically treated to remove accretionary deposits of dust, dirt and soot etc., by using triethanolamine, morpholine, n-butyl acetate, cellosolve and methylated spirit etc. This was finally preserved with 1% poly vinyl acetate in toluene.

59. BHASKARESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL— The exterior surface of the temple was chemically treated for eradicating thick growth of micro-vegetation and pigeon droppings etc. Dilute ammonical solution mixed with teepol was used to soften the accretionary deposits for its easy removal by mild brushing. Cleaned surface was given fungicidal treatment followed by a preservative coat of 2% polymethyl methacrylate acetate in toluene.

60. LINGARAJA TEMPLE-COMPLEX, BHUBANESWAR, DISTRICT PURL— Ganesa temple in the temple-complex was chemically cleaned for removing the thick growth of micro-vegetation by using dilute ammonical solution and teepol with mild brushing. The entire cleaned surface was given fungicidal treatment of 2% zinc silicofluoride suspension followed by a preservative coat of 2% polymethyl methacrylate acetate in toluene.

61. SUN TEMPLE, KONARAK, DISTRICT PURL— The horses on the south side and the south facing exterior wall of *jagamohana* were subjected to chemical treatment for eradication of thick micro-vegetational growth by using dilute ammonia solution and teepol with mild brushing. The entire cleaned surface was given fungicidal treatment followed by a preservative coat of polymethyl methacrylate on the dried surface. The work is in progress.

62. JAGANNATHA TEMPLE, PURI, DISTRICT PURL— The chemical treatment for the removal of tenacious lime-plaster accretions from the northern deplastered surface of *vimana* and on the western and southern sides was continued by physico-chemical means, using 2% solution of acetic acid followed by fungicidal treatment and a preservative coat of 2% polymethyl methacrylate acetate in toluene on completely dried surface.

RAJASTHAN

63. GHATESHVARA MAHADEVA TEMPLE, BADOLI, DISTRICT CHITTORGARH.— The exterior north east surface of the temple was chemically treated to eradicate biological growth, lime and other accretionary deposits. Chemically cleaned area was finally preserved with 2% polymethyl methacrylate acetate after fungicidal treatment.

64. CHITTORGARH FORT, CHITTORGARH, DISTRICT CHITTORGARH.— The chemical treatment work was continued for removing the accretionary deposits from the surface of the Meera Temple. After thorough washing and fungicidal treatment, a preservative coat of 2% polymethyl methacrylate was applied on complete dry surface.

The exterior stone surface of the Shringarchauli Temple was chemically treated with ammonia solution mixed with a non-ionic detergent for the removal of micro-vegetational growth, dust and dirt accretions. The cleaned area was subjected to fungicidal treatment followed by preservation with 2% polymethyl methacrylate in toluene.

The works of chemical treatment and preservation were taken up on the south-east face of Parsvanatha Temple and Saat Bees Deori group of temples in the complex of Temple II. Micro-biological growth and lime accretions were removed from the exterior stone surface of the temple with the help of aqueous solution of ammonia teepol mixture and acetic acid solution respectively by using soft nylon brushes. Fungicidal treatment was given to prevent recurrence of vegetational growth. The cleaned and dried surface was finally preserved with 2% solution of polymethyl methacrylate in toluene.

65. JAGAT SHIROMANI TEMPLE, AMER, DISTRICT JAIPUR.— The chemical treatment work was resumed on the west face of main *sikhara* of the temple for the removal of micro-vegetational and lime accretions. Dilute ammonia solution, teepol and dilute acetic acid were used respectively for the removal of micro-vegetation and lime wash. After thorough washing fungicidal treatment was given and finally a preservative coat of 1 -2% polymethyl methacrylate acetate in toluene was applied on the complete dry surface.

66. PATWA-KI-HAVELI, JAISALMER, DISTRICT JAISALMER.— The exterior surface of the Haveli was chemically treated with suitable chemicals and solvents to remove surface accretions of dust, dirt and thick micro-vegetational growth. The work is in progress.

TAMIL NADU

67. JVARAHARESVARA TEMPLE, KANCHIPURAM, DISTRICT CHENGAI-ANNA.— The chemical treatment was continued and 566 sq m area was chemically cleaned and preserved by using aqueous solution of 3:1 ammonia teepol mixture for eradication of micro-vegetational growth and other accretionary deposits from the exterior surface. Sodium pentachlorophenate 1% was used as fungicide and followed by a coat of 2% Acrypol-p in toluene as preservative.

68. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHENGAI-ANNA.— The extraction of soluble salts from the weathered granite structure was continued with paper pulp treatment. About 313 sq m area of the main *vimana* and walls were treated. Cracks and crevices were filled with epoxy resin mixed with granite powder. The patches of vegetational growth and accretionary deposits of dust and dirt were removed with the help of dilute ammonia and teepol mixture and thoroughly washed. The entire cleaned and salt-free area was given fungicidal treatment and finally preserved with 2% Acrypol-p in toluene.

69. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHENGAI-MGR.— The cells 1-34,41 and 43 of the temple were taken up for restoration and preservation of remnants of Pallava paintings. The old damaged filleting and edging were carefully removed and redone with plaster of Paris mixed with a binder and colour matched. The paintings were treated for the removal of old preservative and other accretionary deposits and finally preserved with 1% poly vinyl acetate in toluene.

70. ROCK-CUT SIVA TEMPLE, THIRUMAYAM, DISTRICT PUDUKKOTTAI.— The pillars, walls and sculptures of the temple were subjected to chemical treatment for the removal of oily, sooty, yellow ochre and lime accretions. These accretions were removed by chemico-mechanical method using ammonia, teepol, acetic acid and oxalic acid. Thoroughly washed surface was given fungicidal treatment prior to-applications of a preservative coat of 2% polymethyl methacry late acetate solution in toluene.

71. ROCK-CUT SIVA TEMPLE, KUNNAKUDI, DISTRICT PASUMPANMUTHU-RAMALINGAM, RAMANATHAPURAM.— The pillars, walls and ceiling of the *mandapa* were chemically treated with dilute acetic solution for the removal of thick lime wash coats by chemico-mechanical means. After complete removal of lime accretions, the surface was cleaned with ammonia teepol mixture and thoroughly washed. Preservative was applied on the dried surface after using the fungicide.

72. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.— The *vimana,* exterior walls and inside pillars of the *mandapa* of the Amman Shrine were subjected to chemical treatment to remove micro-vegetational growth, oily and lime accretions. Ammonia-teepol mixture and acetic acid solution have been applied respectively. The cleaned area was preserved with 2% polymethyl methacrylate acetate in toluene after fungicidal treatment. The work was completed.

73. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.— Thick vegetational growth was eradicated from the extensively carved exterior surface of the main *vimana* of the temple and other sub-shrines. Aqueous solution of ammonia and teepol in the ratio of 3:1 has been used to ease the removal of vegetational growth by mild brushing. Sodium pentachlorophenate (1.5% solution) was sprayed on the cleaned surface as fungicide and finally a preservative coat of 2% polymethyl methacrylate acetate in toluene was applied on the dried surface. Matallic *kalasam* on the top of the *vimana* of the temple was also chemically cleaned and preserved.

74. THIRUVALESVARAM TEMPLE, BRAHMADESAM, DISTRICT TIRUNELVELI.— The thick patchy growth of micro-vegetation of the exterior stone surface and sculptures of the temple was eradicated

by chemical treatment using ammonia teepol mixture. 1.5% solution of sodium pentachlorophenate was sprayed on the cleaned surface as fungicide followed by application of preservative coat of 2% polymethyl methacrylate acetate in toluene.

UTTAR PRADESH

75. FATEHPUR SIKRI-COMPLEX, AGRA, DISTRICT AGRA.— Thick growth of moss and lichen along with other accretionary deposits from the exterior stone surface of Khajana (Aankh Micholi) was removed by chemico-mechanical method using dilute ammonia solution mixed with teepol. Fungicidal treatment was given on the thoroughly washed surface and finally a preservative coat was applied on the dried surface.

The entire surface of sandstone walls of corridor and *burj* of Panch Mahal was subjected to chemical treatment for the eradication of dust, dirt, moss and lichen. Dilute ammonical solution and teepol were used to soften the accretions for easy removal by soft brushing. The washed surface was given fungicidal coat of 2% sodium pentachlorophenate followed by a preservative treatment.

The stone surface of roof walls and plaster surface facing west of Diwan-i-Am, covered with thick layers of moss, algae apart from dust, dirt and particulate matter was subjected to chemical treatment using ammonia solution and teepol mixture in suitable concentration. After thorough washing, fungicidal treatment with 2-3% sodium penta chlorophenate was applied. The surface was allowed to dry completely and finally preserved with two coats of 2% polymethyl methacrylate acetate.

76. ITMAD-UD-DAULA, AGRA, DISTRICT AGRA.— The mural paintings of eastern verandah and adjacent room were chemically treated to remove the old preservative coat using suitable organic solvents and chemicals. Dust, dirt and other superficial accretions were also removed with the help of solvents like cellosolve, benzene, methylated spirit, butyl lactate, triethanolamine, etc. The entire cleaned surface was given a preservative coat of 1% polyvinyl acetate in toluene.

77. TAJ MUSEUM BUILDING, TAJ MAHAL, AGRA, DISTRICT AGRA.— The red sandstone surface of walls and corridor (outside) extending to east and west of outer entrance of platform walls of the museum building covered with thick growth of micro-vegetation along with dust, dirt, and particulate matter were subjected to treatment by using dilute solution of ammonia and a non-ionic detergent teepol. The cleaned surface was given fungicidal treatment to ensure non-occurrence of early vegetational growth followed by a preservative coat of 2% polymethyl methacrylate acetate on the stone surface.

78. MULAGANDHA-KUTI, SARNATH, DISTRICT BANARAS.— The work was continued for the eradication of micro-vegetational growth and adhered dust, dirt with the help of dilute ammonia and teepol mixture. After cleaning, fungicidal treatment was given by spraying 2-3% solution of sodium pentachlorophenate followed by a preservative coat of 2% polymethyl methacrylate acetate in toluene.

79. GROUP OF TEMPLES, ADIBADRI, CHAMOLI, DISTRICT CHAMOLI.— The chemical treatment was carried out on the exterior stone surface of this group of temples for the eradication of moss, lichen and other accretionary deposits. After cleaning, the surface was given fungicidal treatment followed by a preservative coat of 2% polymethyl methacrylate solution in toluene. The work has been completed.

80. MONASTERY, KUSHINAGAR, DISTRICT DEORIA.— The removal of thick micro-vegetational growth was continued by gentle scrubbing with 2% aqueous solution of ammonia mixed with non-ionic detergent. About 540 sq m area was preserved after chemical cleaning and fungicidal treatment using 3-4% polymethyl methacrylate acetate solution in toluene.

81. RANI MAHAL, JHANSI, DISTRICT JHANSI.— Loose sandstone sculputres were subjected to chemical treatment for the removal of accretionary deposits of dirt, dust, moss, lichen and lime coatings. Dilute ammonia-teepol mixture solution and acetic acid solution were used for the removal of dirt, dust, moss and lime coatings. Sculptures were thoroughly washed after cleaning and given fungicidal treatment followed by a coat of preservative with 2% polymethyl methacrylate acetate in toluene.

The mural paintings in the Darbar Hall and staircases of this monument hidden under several coatings of thick lime were exposed by chemico-mechanical means. Superficial accretions were removed with the help of suitable solvents and chemicals followed by a preservative coat of 2% solution of poly vinyl acetate.

82. DIANUT-UD-DAULA, KARBALA, LUCKNOW, DISTRICT LUCKNOW.—The plastered surface was chemically treated with ammonia-teepol solution for the eradication of micro-vegetational growth, dust and dirt etc. After chemical treatment, the entire surface was given fungicidal treatment of 1 % solution of sodium pentachlorophenate followed by a preservative coat of 2% polymethyl methacrylate acetate in toluene.

83. TOMB OF MURSHID JADI BEGUM, LUCKNOW, DISTRICT LUCKNOW.— In continuation of the previous year's work (*1993-94,* p.201), the exterior lime-plaster surface was chemically treated with suitable chemicals and solvents in appropriate concentration for the removal of thick micro-vegetational growth and other accretionary deposits. The cleaned surface was thoroughly washed and given fungicidal treatment of 1% solution of sodium pentachlorophenate followed by two coats of 2% polymethyl methacrylate acetate in toluene on the dried surface as preservative.

WEST BENGAL

84. KRISHNA CHANDRA TEMPLE, KALNA, DISTRICT BARDHAMAN.— Thick micro-vegetational growth was removed from the surface by soft and gentle scrubbing with nylon brushes in wet condition using ammonia-teepol mixture. The entire surface was subjected to fungicidal treatment followed by application of a preservative coat.

85. HAZARDUARI PALACE MUSEUM, DISTRICT MURSHIDABAD.— Nine oil paintings and one paper painting were chemically treated. Repair and colour reintegration work was also attended to as per requirement. A good number of metallic objects *viz.,* revolver, spear, canvas, axe, etc., were also treated and preserved.

TREATMENT AND PRESERVATION OF EXCAVATED AND MUSEUM OBJECTS[1]

1. A Holy Quran received from the Mumtaz Mahal Museum, Red Fort, Delhi, was chemically treated, restored and preserved by Zonal Laboratory, Delhi. As a preventive measure Quran was first subjected to fumigation using thymol as fumigant for a fortnight. Deacidification of paper was done by exposing the pages to ammonia fumes in a fumigation chamber. Aqueous method was not adopted because of the use of Indian Ink. Pin holes in paper and cover flaps were filled. Detached and broken leather covers have also been restored in best possible manner.

2. Seventy-seven copper coins received from the Archaeological Museum, Chandragiri, District Chittoor and one hundred seventy-four coins and metallic antiquities found during Hampi excavation and twelve coins from Banavasi excavation were chemically treated for the removal of accretionary deposits and preserved. Two canvas panel paintings of the Archaeological Museum, Srirangapatna, were also chemically treated and preserved. Seventy-two estampages from the Epigraphy Branch, Mysore, were treated after deacidification by applying alcoholic solution of barium hydroxide or ammonia fumes and then it was preserved with polyvinyl acetate in toluene.

3. The monitoring of ambient air quality and micro-climate was continued by Air Pollution Monitoring Laboratory, Agra, to have close watch on the levels of various gaseous pollutants and paniculate matter to assess their impact on Agra monuments.

(i) Annual average concentration of sulphur dioxide in ambient about atmosphere of the Taj Mahal was measured 24.82 ug/m while a monthly average concentration was found to be 83.10 in winter which is quite high in comparison to the prescribed standard limits.

(ii) Dust fall measurements were continued in the vicinity of the Taj Mahal, Sikandara and Red Fort. Taj Mahal had received appreciable dust pollution during the month of June while Sikandara experienced the maximum in May.

(iii) Regular monitoring of sulphation rate at Taj Mahal and Sikandara showed higher values at the Taj Mahal than Sikandara.

(iv) SPM acts as a carrier for condensed gaseous pollutants which when settled over the stone surface by impinging cause soiling of the stone surface. The reactive anions present in the SPM under favourable conditions may corrode the stone surface in the long run. Annual average and

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[1]Information from: 1 to 6, Director (Science), Chemical Branch of the Survey; and 7, The Department of Archaeology, Government of Andhra Pradesh.

maximum recorded values during the year 1994-95 were 335-12 ug/m and 1228.81 ug/m respectively, which are on higher side in comparison to the standard limit prescribed by CPCB.

(v) Analysis of rain-water of early showers gives important information regarding nature and concentration of air-borne pollutants. The deleterious salts like sulphates, chlorides, bicarbonates and NOx were quantitatively analyzed in the rains observed first or with a different time interval of atleast ten days. The data have been compiled in "a report on Air Pollution Data in Agra 1993-95, Archaeological Survey of India, July, 1996".

4. Monitoring of sulphation rate, dust fall rate and suspended paniculate matter was continued to keep vigil on pollution levels in the vicinity of Red Fort, Delhi. The structures in the Red Fort complex, Delhi, especially on the eastern side are exposed to pollution due to heavy vehicular traffic on the Ring Road and nearby Indraprastha Thermal Power Station. Annual average of SPM was recorded 555.0 ug/m. The monthly average had suddenly increased to 765.74 ug/m in the month of September, 1994 and to the maximum during 1994-95.

5. An iron and ten copper objects received from Mandu sub-circle and two wall maps belonging to the Holkar dynasty displayed in the office of the Collector, Central Excise, Indore, were chemically treated and preserved by Divisional Laboratory, Indore.

6. Sixty-two copper coins, thirty-five lead coins, twenty-eight iron, thirty copper and three lead antiquities recovered during Sopara excavation; easel paintings of Mahatma Gandhi House, Porbandar, Gujarat and Quran received from the Archaeological Museum, Red Fort, Delhi, were chemically treated and preserved by Laboratories, Dehradun.

7. Five hundred and fifty lead coins from Sekuru, Chebrole mandal, District Guntur; Chalcolithic copper antennae swords from Remmanaguda, Gajwel mandal, District Medak; sixteen copper coins from Kotilingala, District Karimnagar; and two hundred and ninty-five lead coins of Talavara type from the State Museum, Government of Andhra Pradesh, were chemically treated and preserved.

RESEARCH AND ANALYSIS[1]

(i) Analytical studies of coloured glazes from Chini-ka-Rauza, Agra (Uttar Pradesh), were carried out in order to know their colour constituent.

(ii) Plaster samples from the monuments of Sultanate period, Delhi, have been analyzed to have information regarding chemical composition and materials used in different periods.

(iii) In connection with conservation of Mubarak Mandi-complex and art work, studies have been carried out. Plaster, pigments and glass samples collected from *toshakhana* were chemically analyzed.

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[1]Information from: Director (Science), Chemical Branch of the Survey, Dehradun.

(iv) Analysis of accretionary deposits from *garbhagriha* of JagannathaTemple, Puri, Orissa, was carried out to ascertain the presence of deleterious chemical species responsible for damage to sandstone.

(v) Physico-chemical properties of Mercula, a local clay used in the construction of adobe structures of monasteries of Ladakh region, Jammu and Kashmir, were studied with a view to use the original materials for sealing of cracks in restoration and conservation work of painted plaster and rendering.

(vi) In connection with restoration of stucco-plaster work of Raza Library, Rampur, Uttar Pradesh, analysis of plaster was carried out to have information regarding the nature and chemical composition of plaster.

(vii) Physical parameters were studied for two stone samples of Dvarakadhish Temple, Dwarka, Gujarat and Diu Fort, Diu.

(viii) SEM studies were carried out for stone samples of Kailasanatha Temple, Ellora, Maharashtra; Angkor Vat Temple, Cambodia; floating bricks of Hanamkonda, Andhra Pradesh and iron samples.

(ix) Three stone samples from Sun Temple, Modhera, Gujarat, were analyzed to have information regarding the chemical composition.

(x) Bat's excreta samples have been collected from different caves of Ajanta, Maharashtra and analyzed to gather information regarding chemical constituents responsible for the spread of patches and damaging the painted plaster. Studies were also aimed at developing suitable methodology for cleaning of ugly patches of excreta and to stop its spreading.

XI. ARCHAEOLOGICAL GARDENS[1]

MAHARASHTRA

1. DAULATABAD FORT, DISTRICT AURANGABAD.— During the period under review, besides completing the landscaping at Daulatabad Fort, phase-II, a garden was developed in 1.5 acre area of the monument.

ORISSA

2. BRAHMESVARA TEMPLE, DISTRICT BHUBANESWAR.— A garden was developed around the temple.

3. KHANDAGIRI AND UDAYAGIRI, DISTRICT BHUBANESWAR.—The work of tree plantation around the monument has been completed in the first phase. A deep borewell for irrigation was also provided.

UTTAR PRADESH

4. TAJ MAHAL-COMPLEX, DISTRICT AGRA.— A pop up sprinkler system of irrigation has been established at one of the lawns in the forecourt of Taj Mahal.

WEST BENGAL

5. RASMANCHA, BISHNUPUR, DISTRICT BANKURA.— A garden around the monument was developed during the period under review.

6. PALACE-COMPLEX, COOCH BEHAR, DISTRICT COOCH BEHAR.—A garden was laid out besides boring a tubewell and arranging electrification for borewell.

7. ADINA MOSQUE, GAUR, DISTRICT MALDA.— The work of developing a garden around the monument was completed.

8. EKLAKHI MOSQUE, GAUR, DISTRICT MALDA.— Around the mosque a garden was laid **out** during the period under review.

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[1]Information from: The Chief Horticulturist, the Horticulture Branch of the Survey, Agra.

XII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

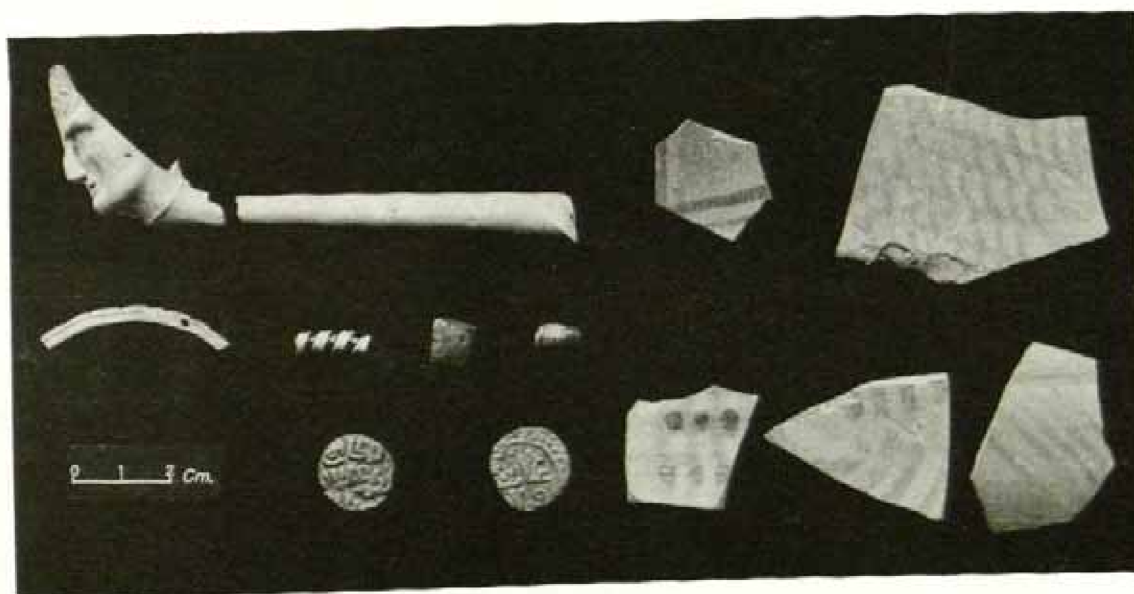
1. MEMOIRS OF THE-ARCHAEOLOGICAL SURVEY OF INDIA.— TWO issues, No. 90, *Excavations at Kaveripattinam* by K.V. Soundara Rajan and No. 91, *Angkor Vat-India's Contribution in Conservation 1986-1993* by B. Narasimhaiah were brought out.

2. NEW IMPERIAL SERIES.— Seven issues of New Imperial Series, *The Jaina Stupa and other Antiquities of Mathura* by V.A. Smith; *Antiquities of Indian Tibet,* Vols. I by A.H. Francke; *Antiquities of Chamba State,* Vol. I by J.Ph. Vogel; *Antiquities ofChamba State,* Vol. **II** by B. Ch. Chhabra; *Report on the Elura Cave Temples and the Brahmanical and Jaina Caves in Western India* by J. Burgess; *The Sharqi Architecture ofjaunpur, with notes on Zafarabad, Sahet-Mahet and Other Places in the North-Western Provinces and Oudh* by A. Fuhrer were reprinted.

3. ANNUAL REPORT ON INDIAN EPIGRAPHY.—The issue for the year 1985-86 was published and for the year 1984-85 is in press.

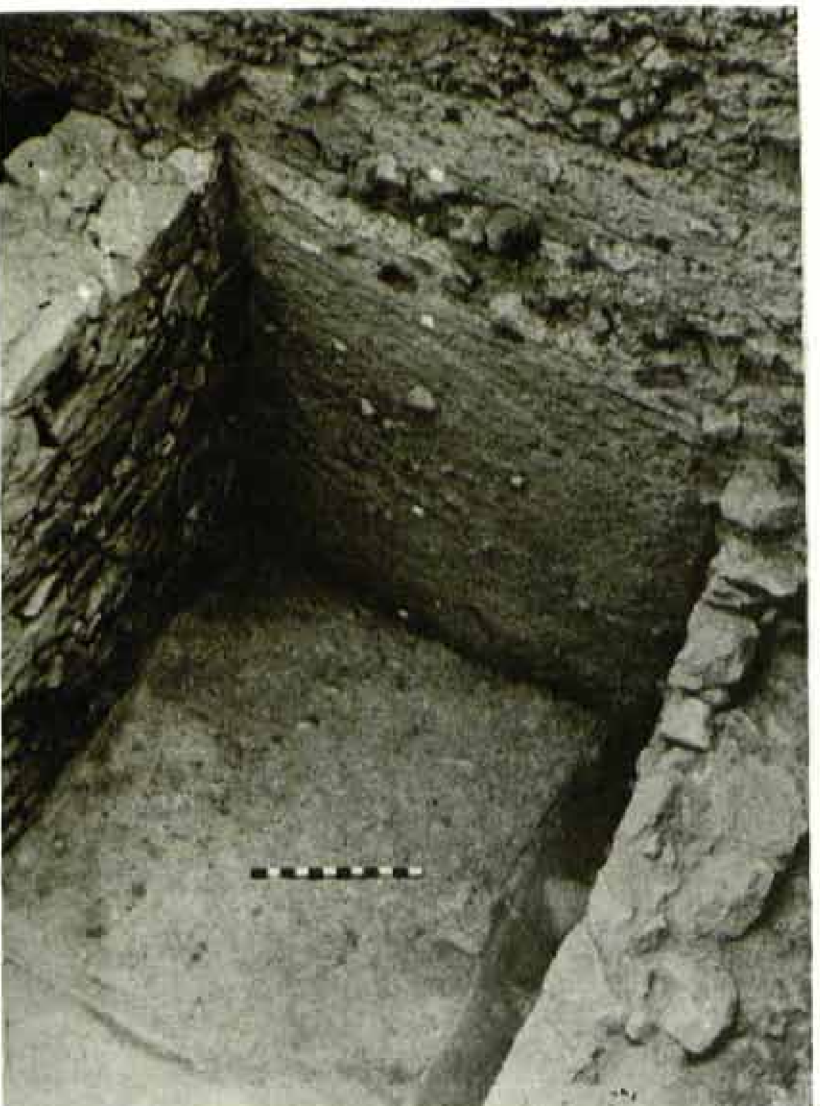


A

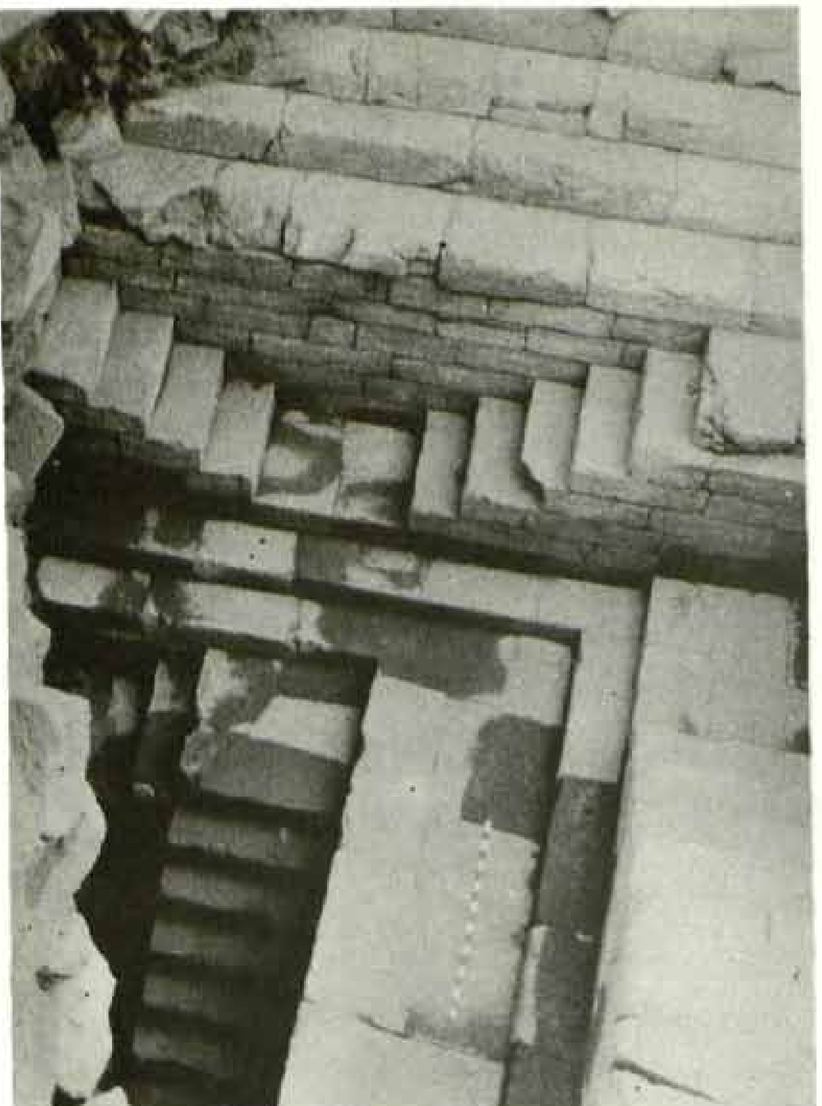


B

Salimgarh Fort: A, *early levels;* B, *pottery and antiquities, Anglo-Mughal phase.* *See p. 6*

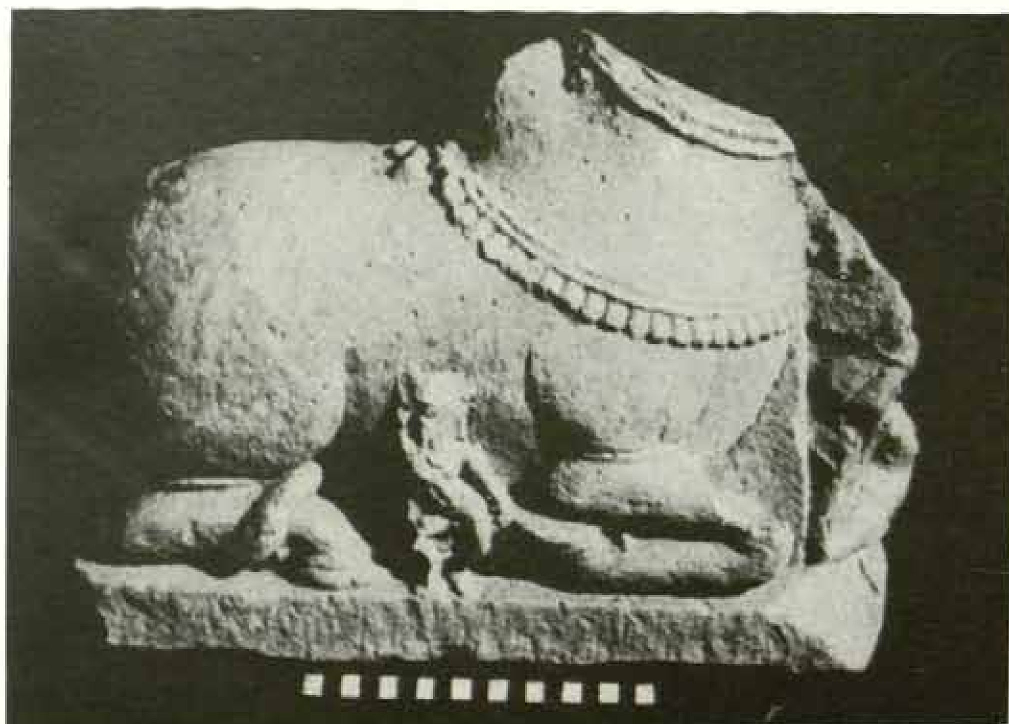


A



B

Lal Kot: A, structures and floor; B, steps of Anang Tal, Period I. See pp. 8-9



A

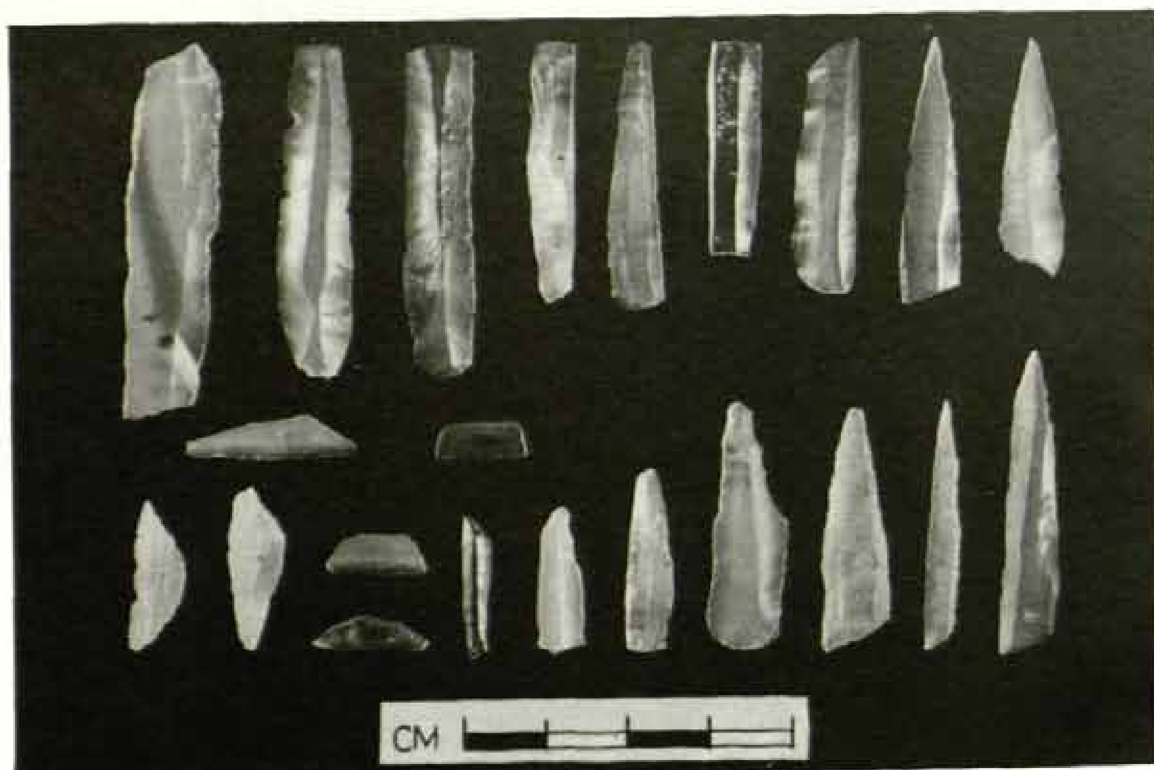


B



C

Lal Kot: A, *stone nandi (found in the structures of Period II);* B *and* C, *red ware sherd with Nagari characters, Period I.* *See pp. 9 and 11*

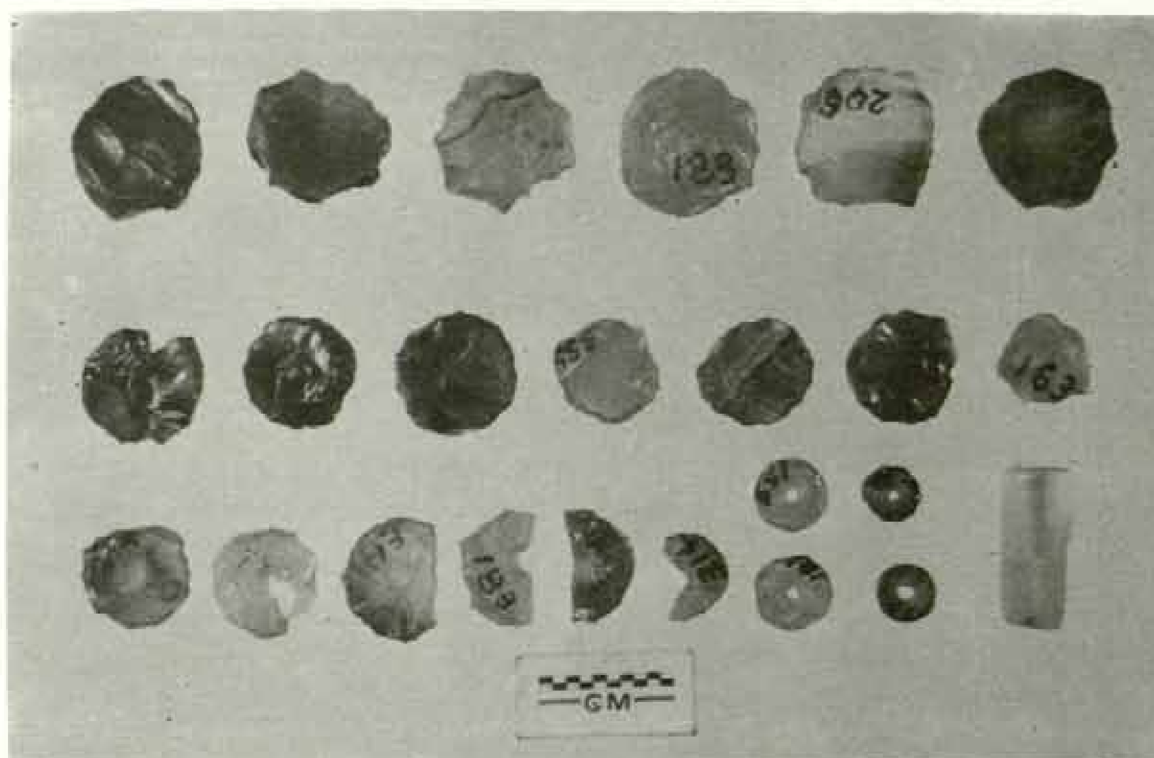


A

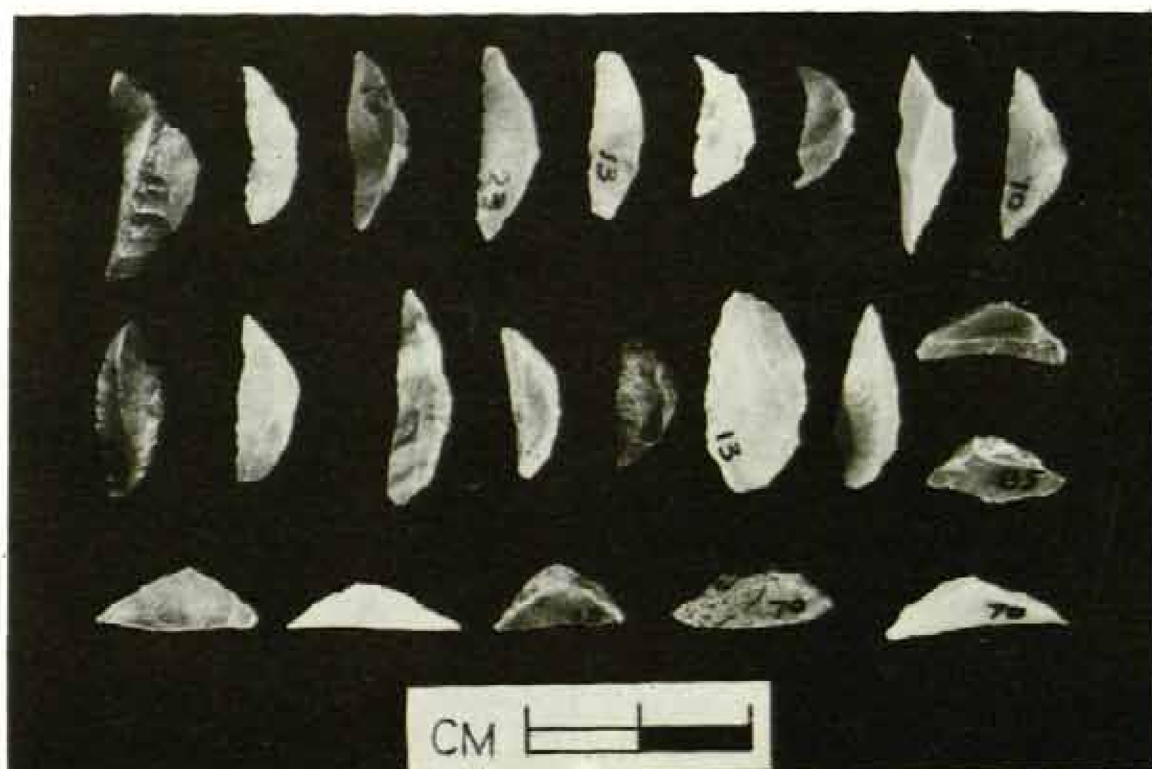


B

Datrana: A, blades; B, blade cores (IV). See p. 13

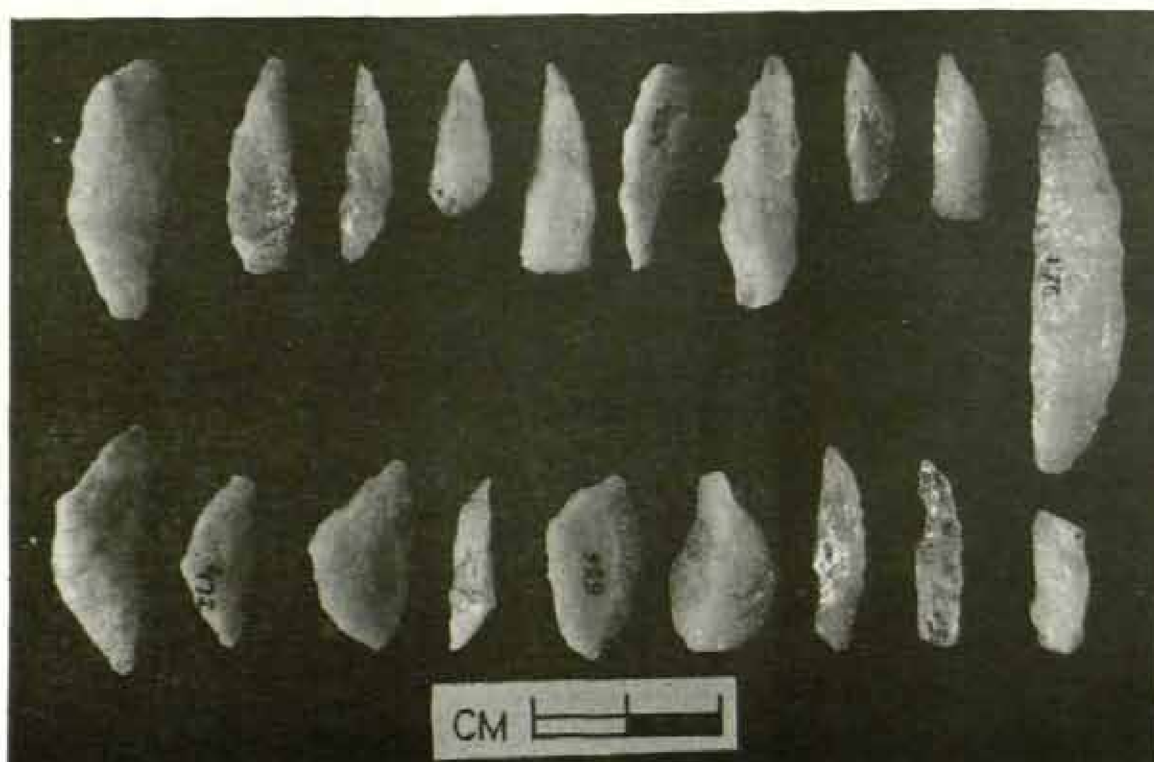


A

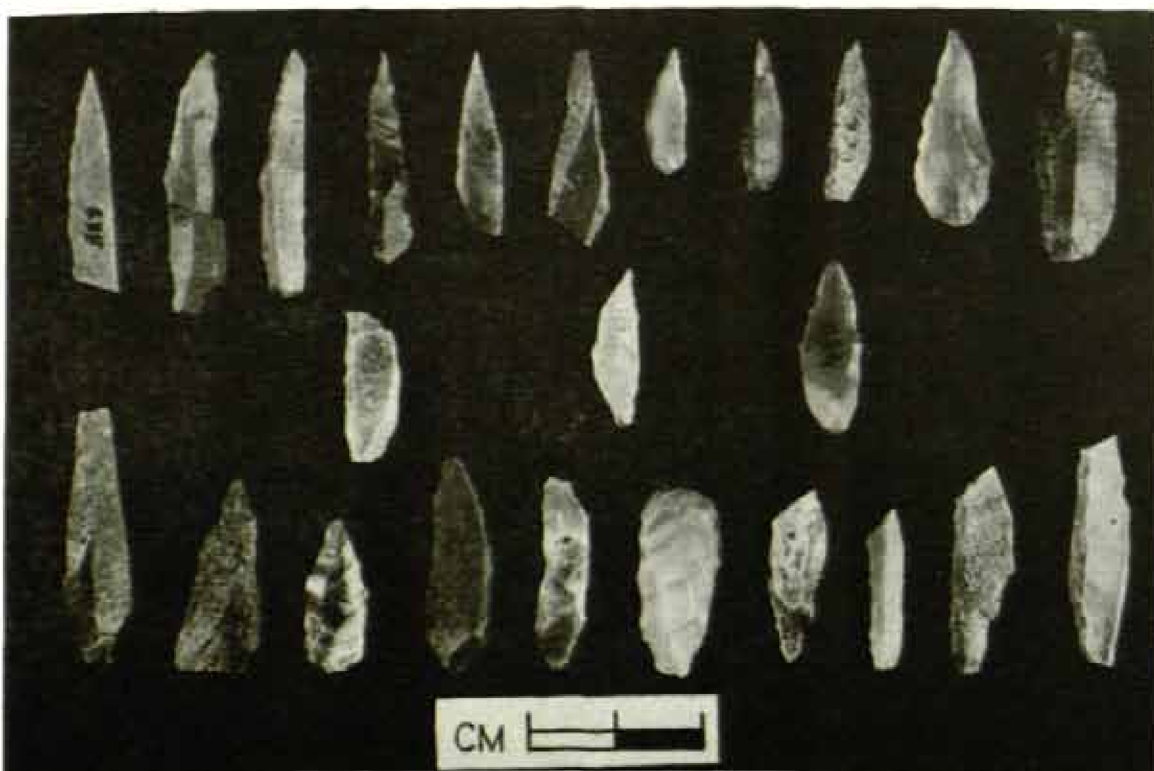


B

Datrana: A, *bead preforms and raw material (IV);* B, *geometric and non-geometric microliths (V).* *See p. 13*

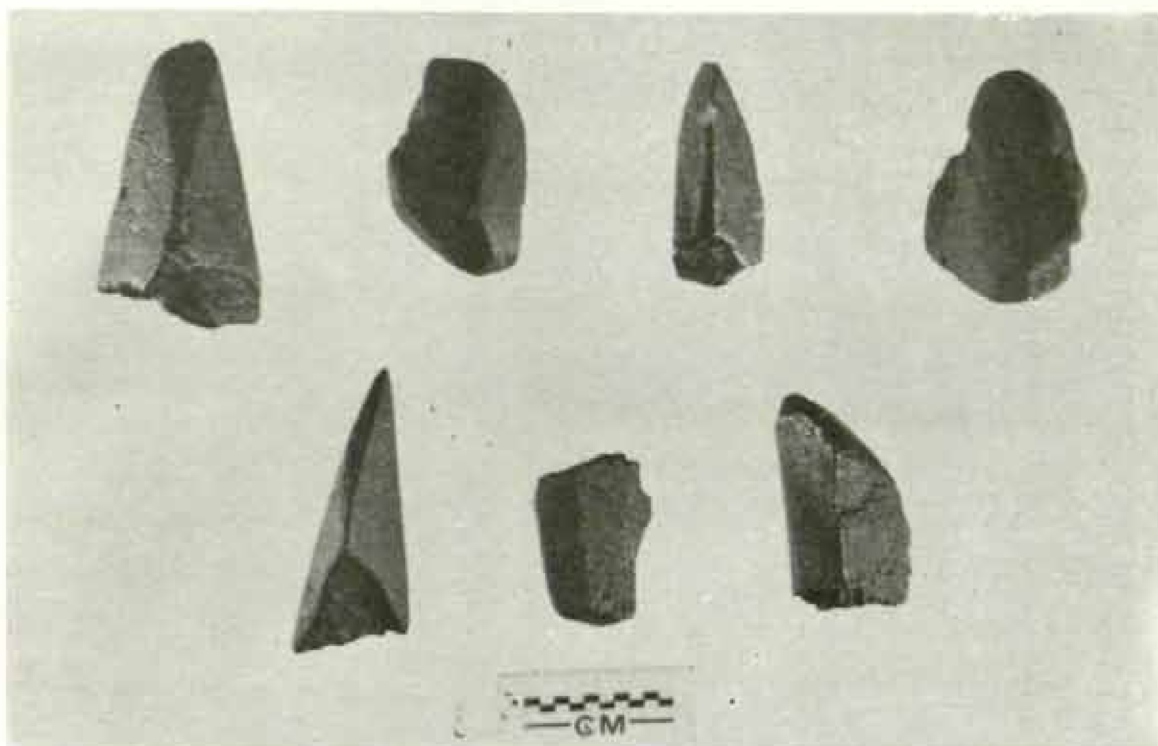


A

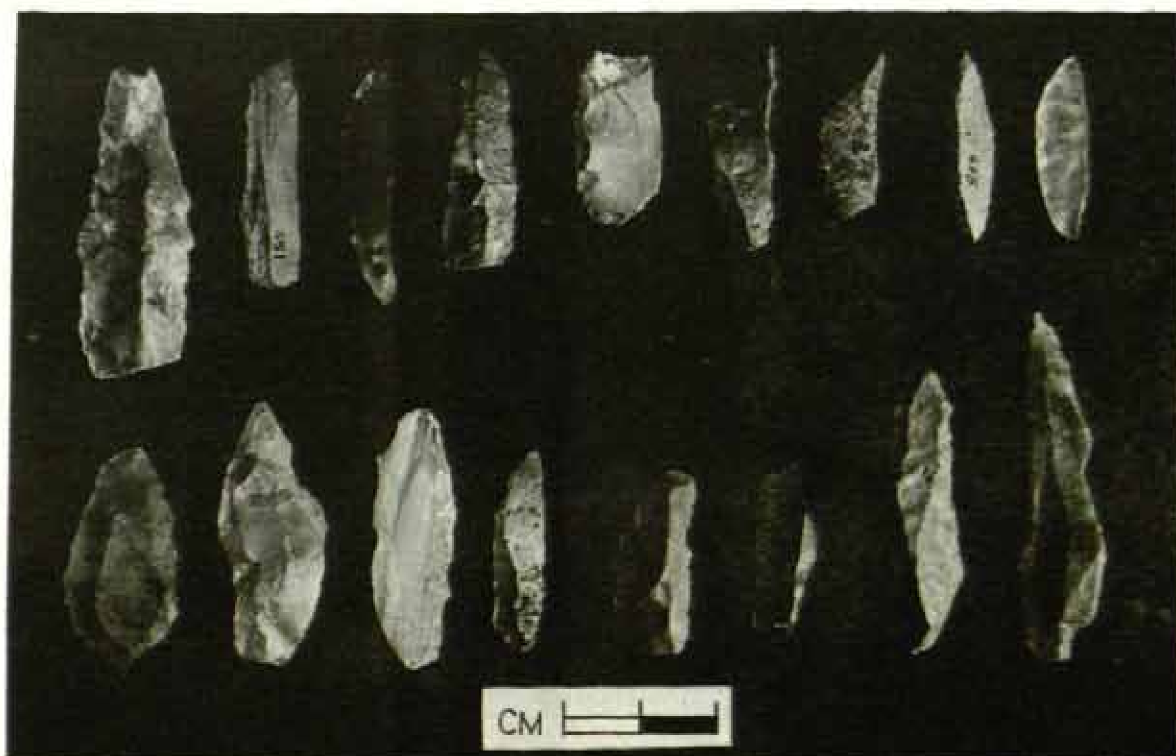


B

Ambakut: A-B, mesolithic tools in quartz. See p. 19

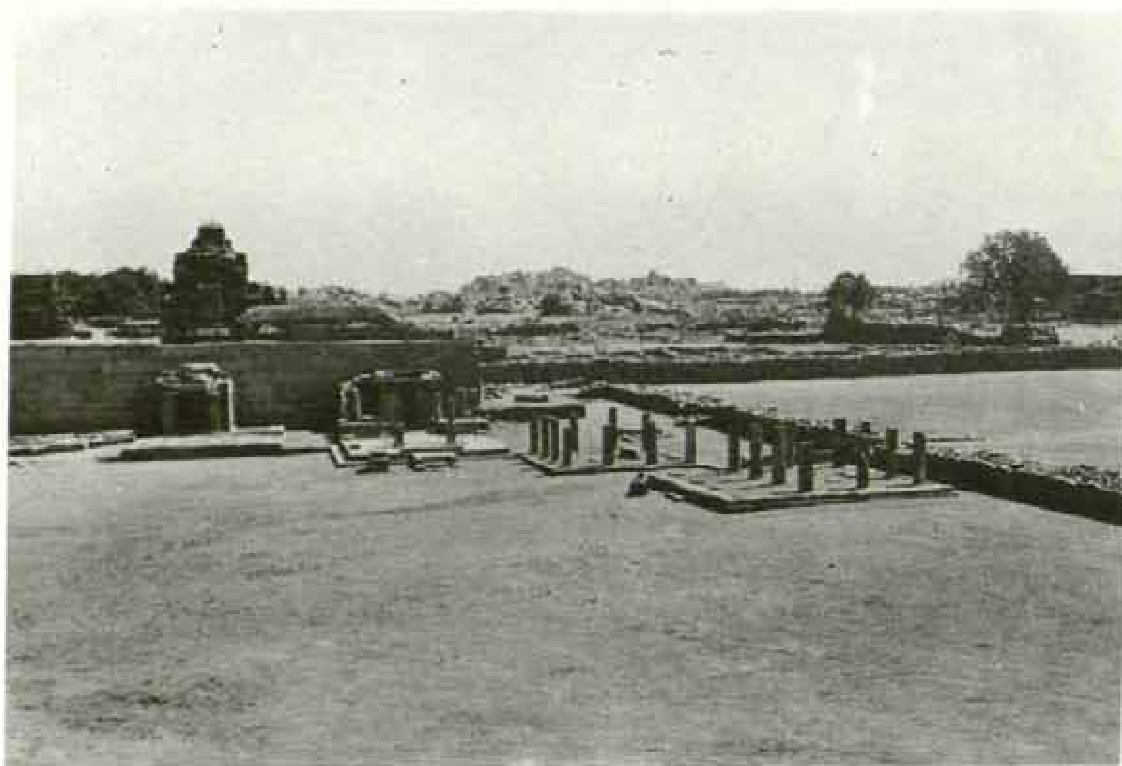


A



B

Ambakut: A-B, *mesolithic tools. See p. 19*



A



B



C

Hampi: A, sila-mandapa after conservation; B, inscribed pedestal and C, image of Bhuvanesvari. See pp. 29-30



A

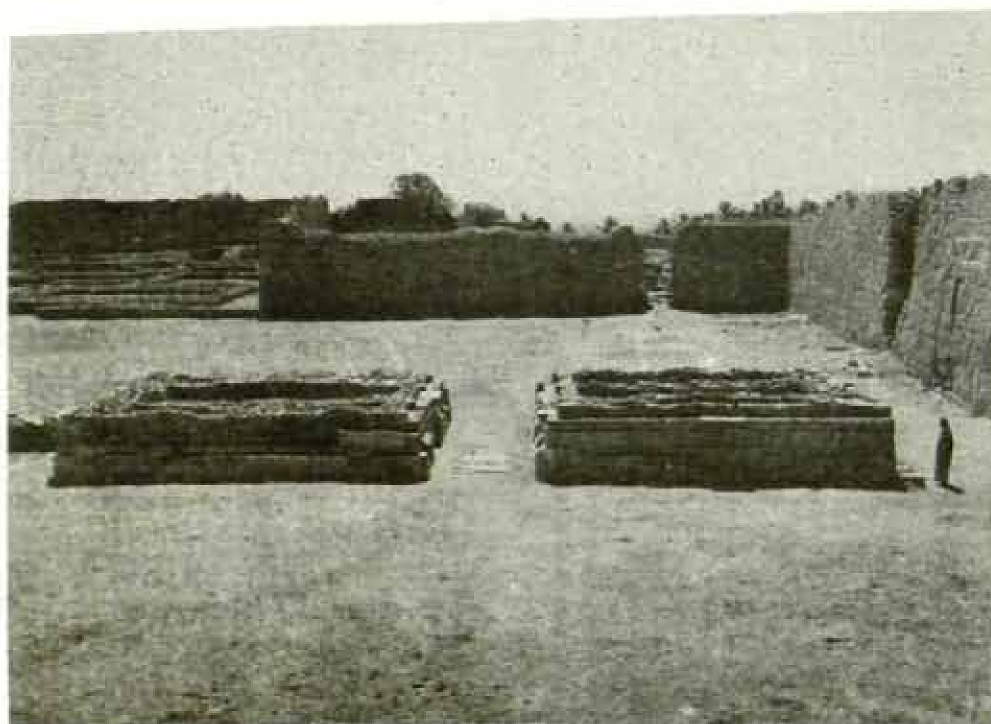


B

Hampi: A, inscribed pillar; B, toilet-block (view from west). *See p. 30*

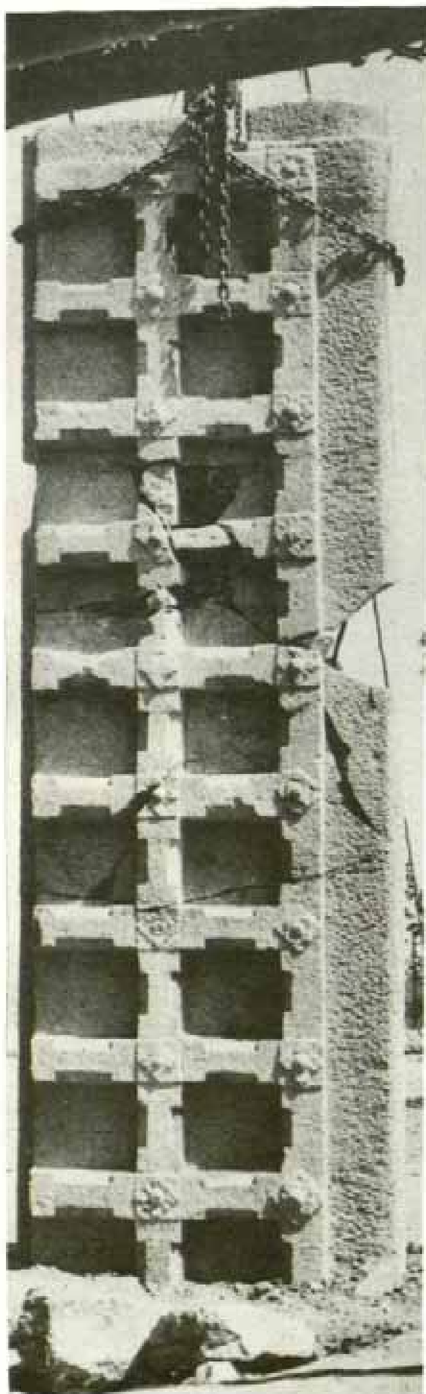


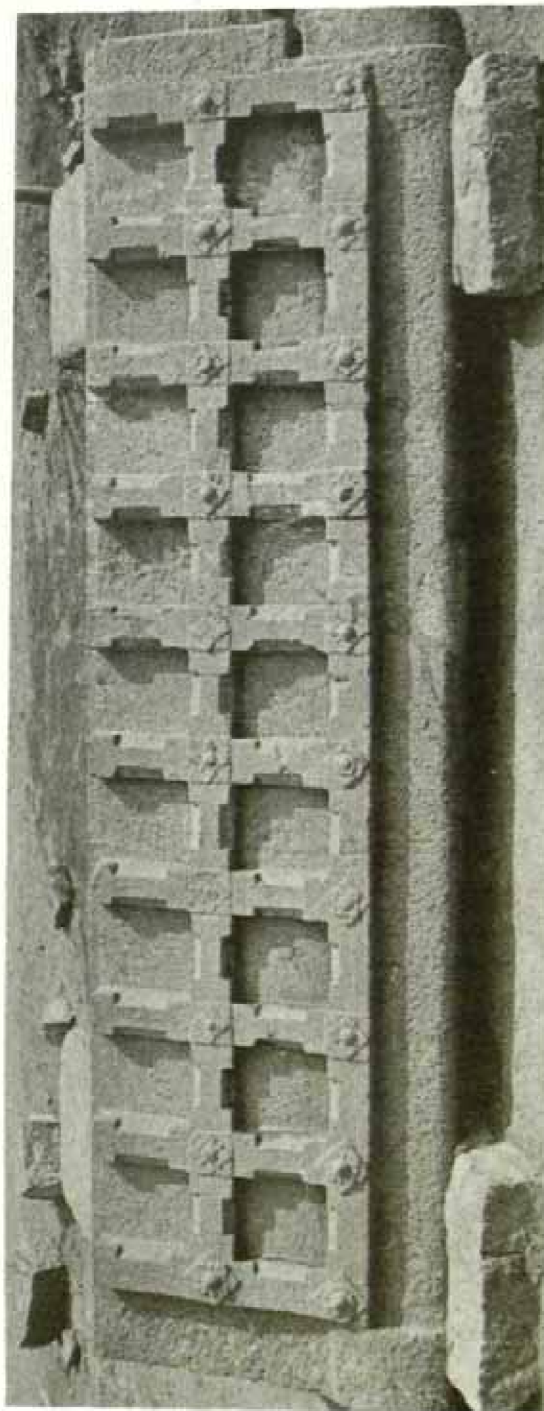
A



B

Hampi: A, before excavation; B, after conservation of mahadvara and screen-wall between Rangamahal and Harihara's palace. See p.31





Hampi: before and after mending of door near Mahanavamidibba. *See p. 32*



A



B

Kanaganáhalli: A, *stupa-railing and* B, *railing details.* *See p. 38*



A



B

Kanaganahalli: A-B, *lower drum-slab. See*

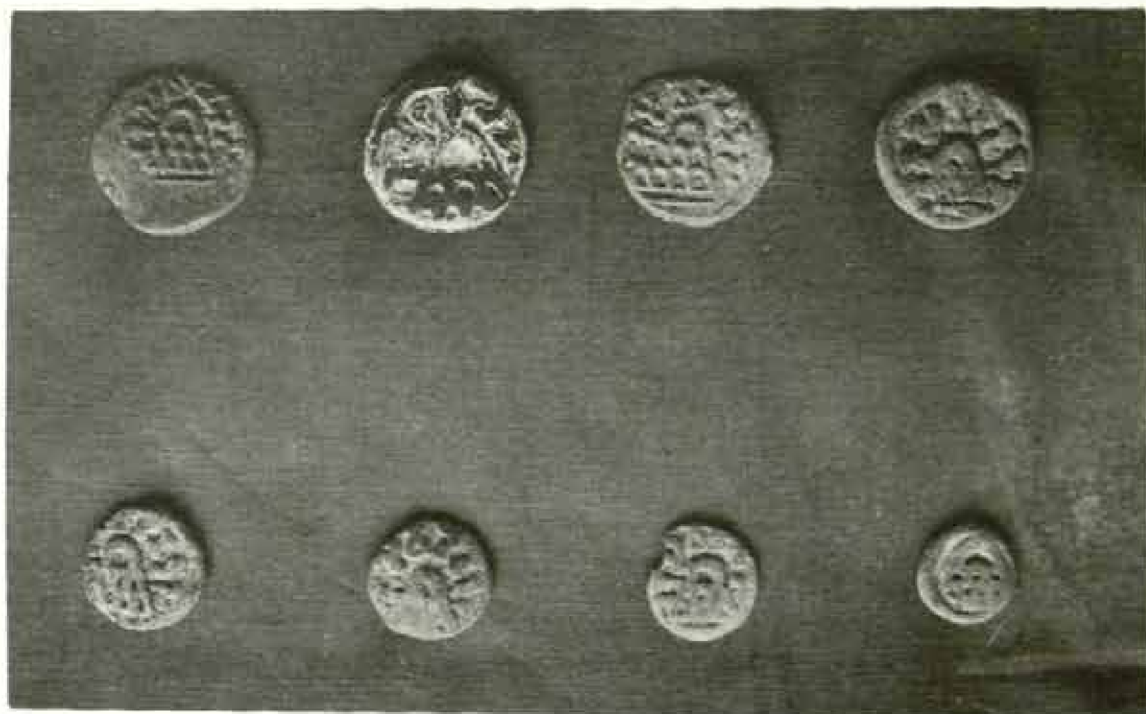


A

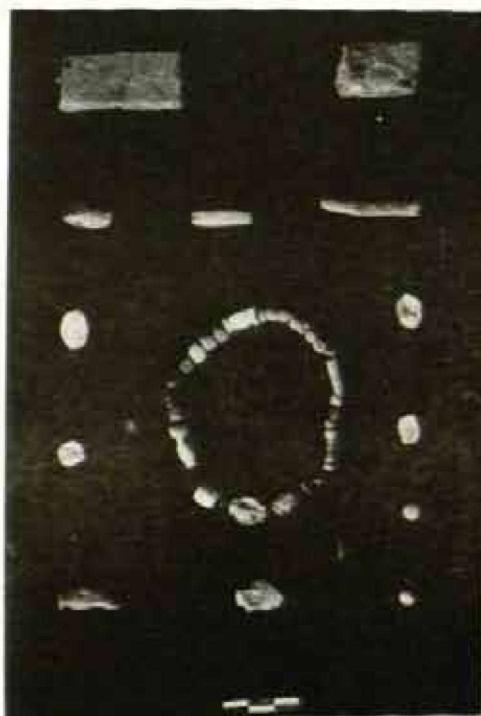


B

Sannati: A, exposed trench; B, brick-built well. *See p. 39*



A



B



C

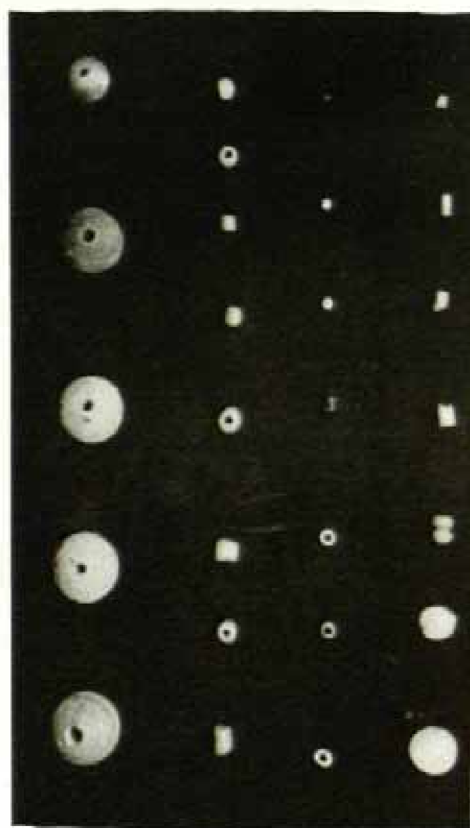
Banavasi: A, *potin coins;* B, *beads and* C, *carved ivory comb.* *See p. 40*



A

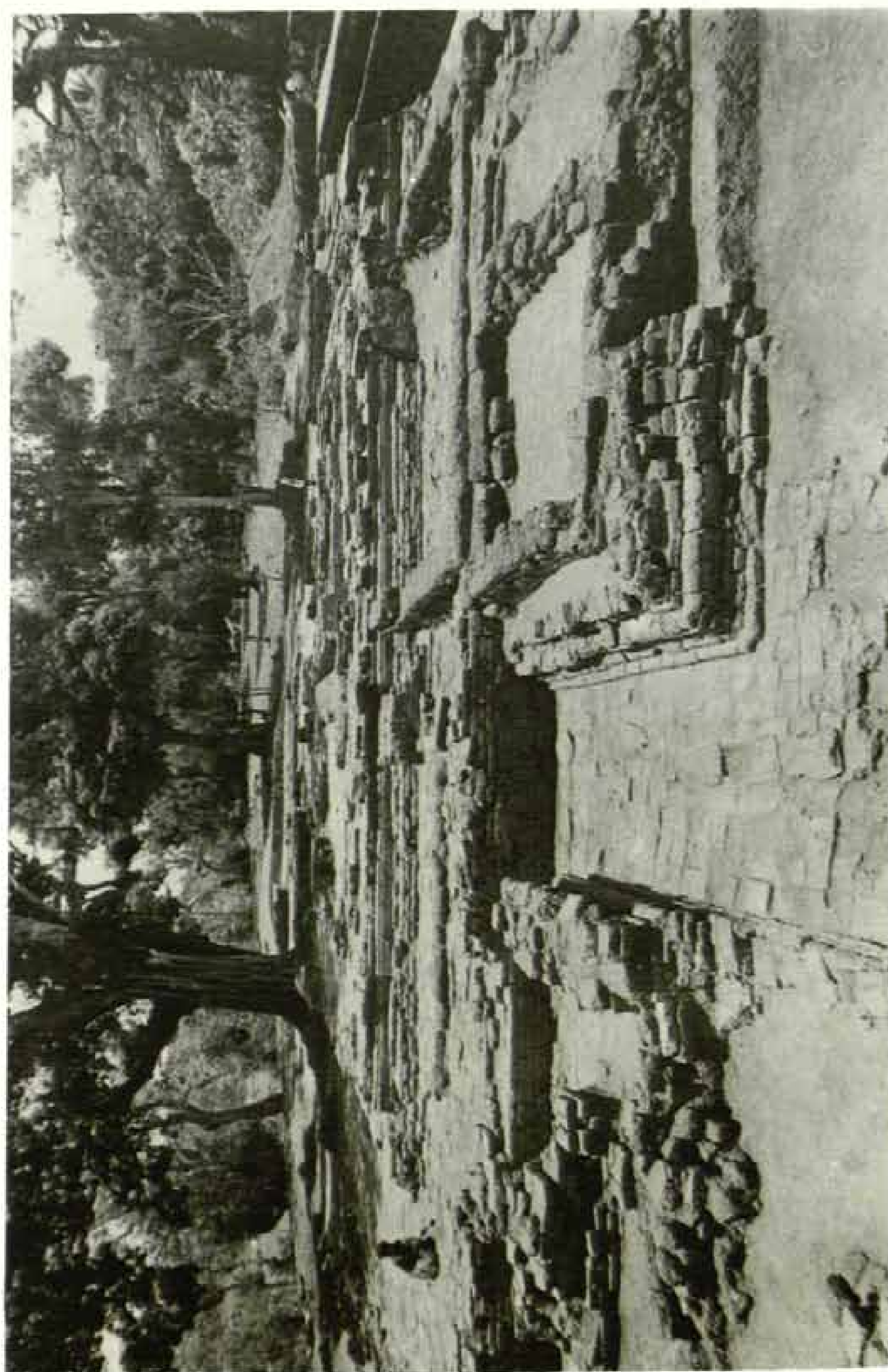


B

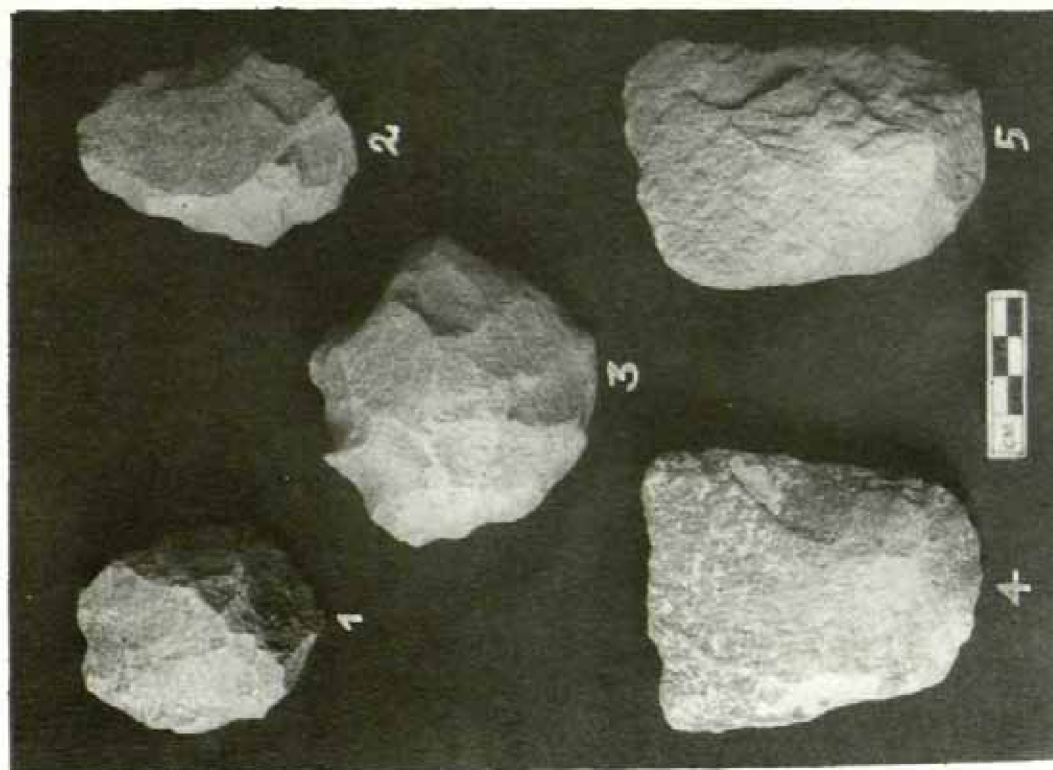


C

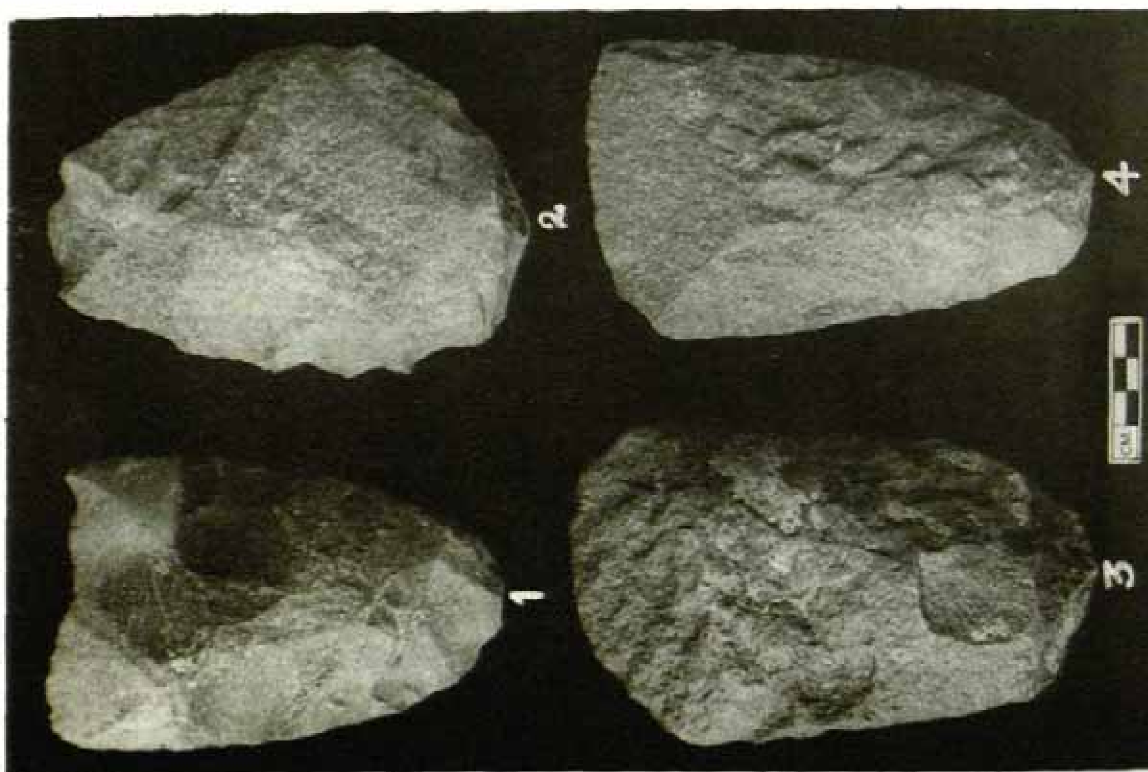
Banavasi: A, enclosure-wall; B, ivory objects and C, beads, Period II. *See p. 40*



Gudnapura: structural-complex. *See p.41*

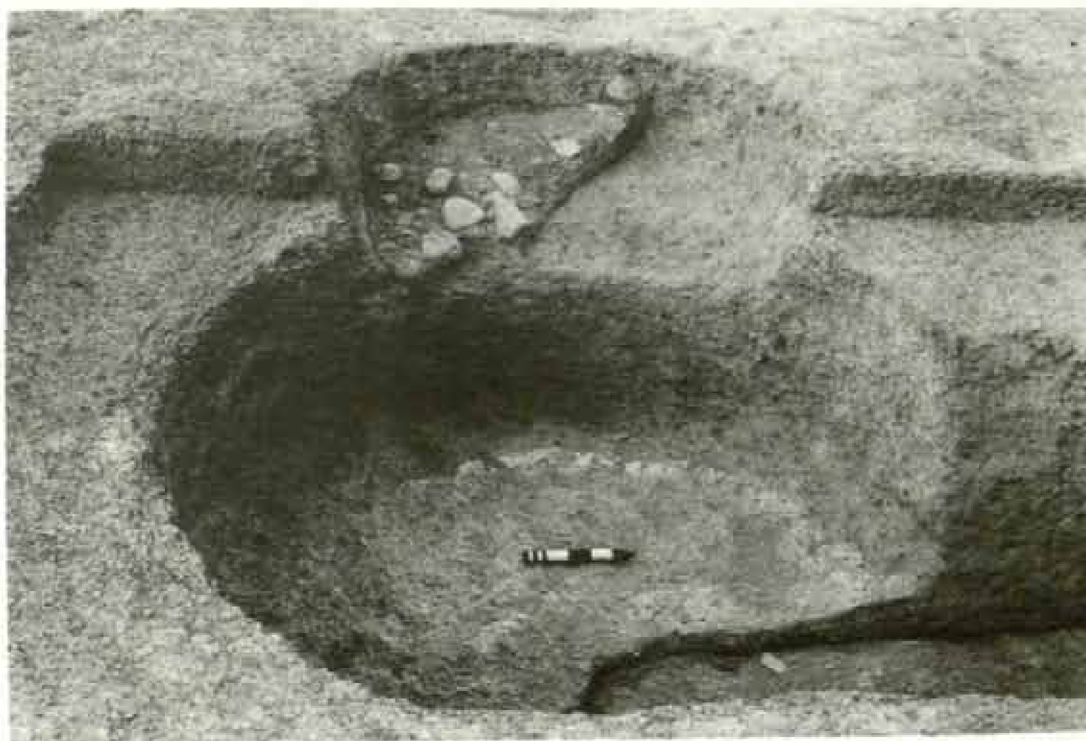


B

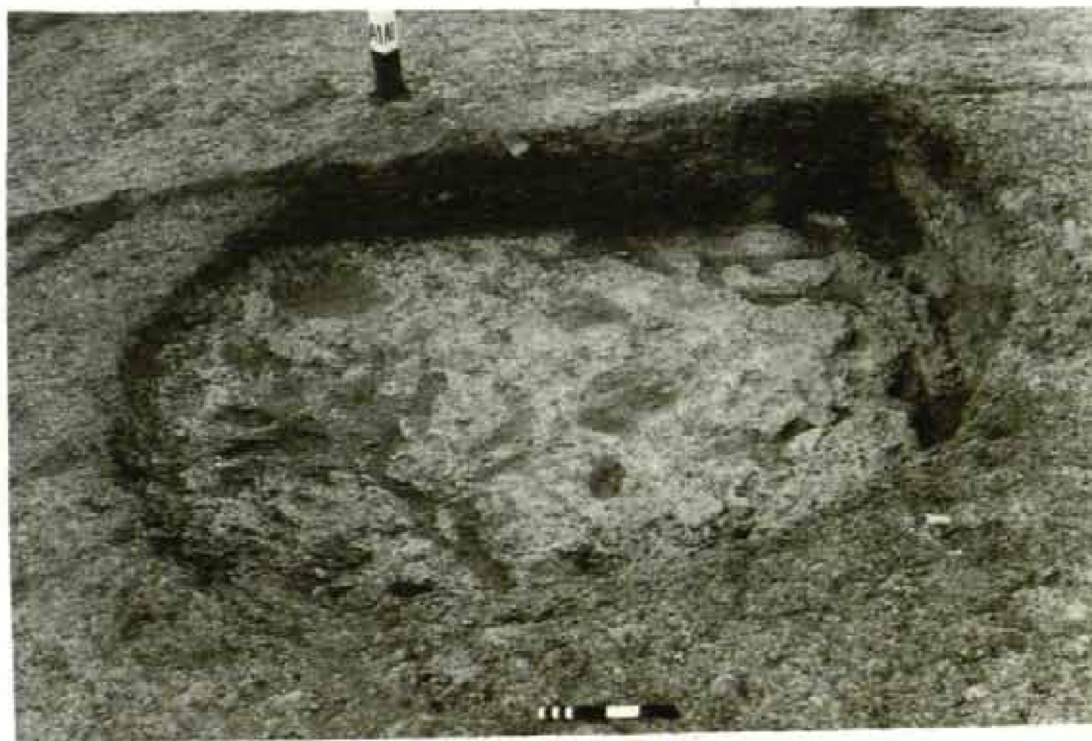


A

Lower Palaeolithic tools: A, Surajkund and Sardarnagar; B, Hathnora, Ramnagar and Nimton. *See pp. 45-46*



A



B

Pipri: A, dwelling pit with steps; B, lime-plastered sunken-floor. *See p. 47*



A

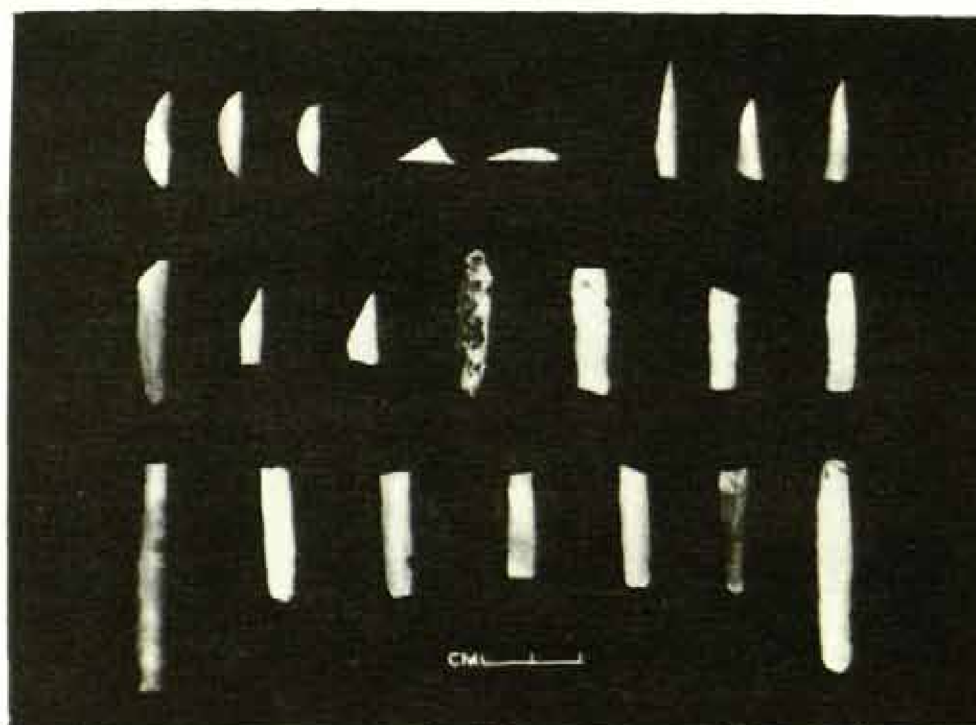


B

Pipri: A, *community hearth;* B, *animal burial.* *See p. 47*

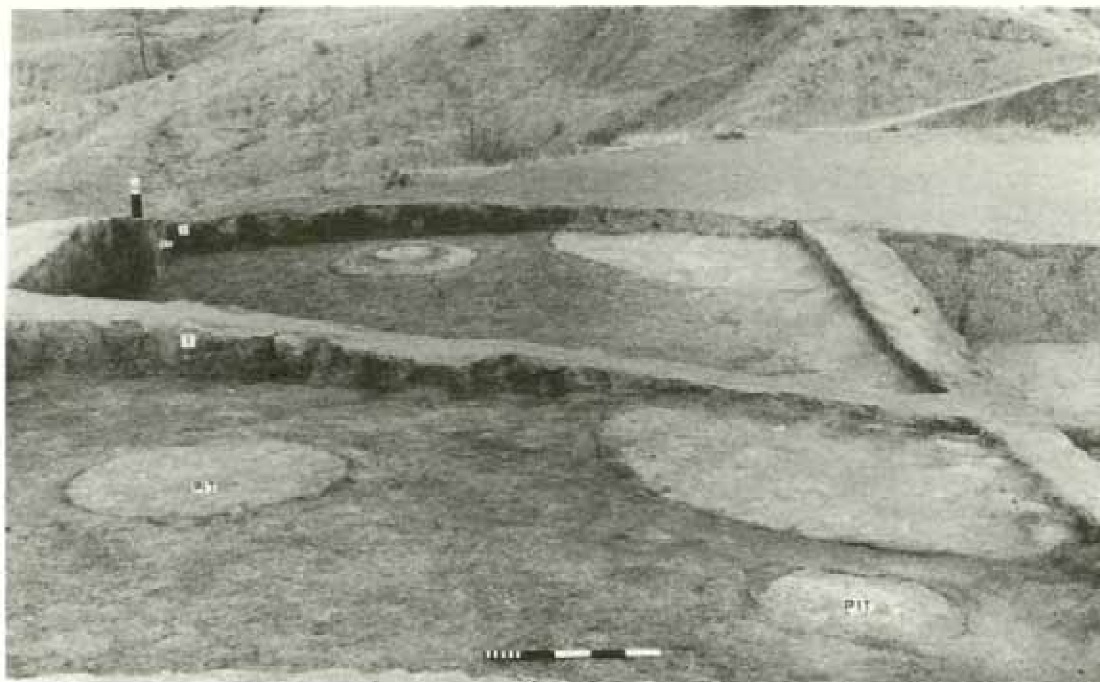


A



B

Pipri: A, painted black-on-red ware jar; B, blade artefacts. *See p.48*



A

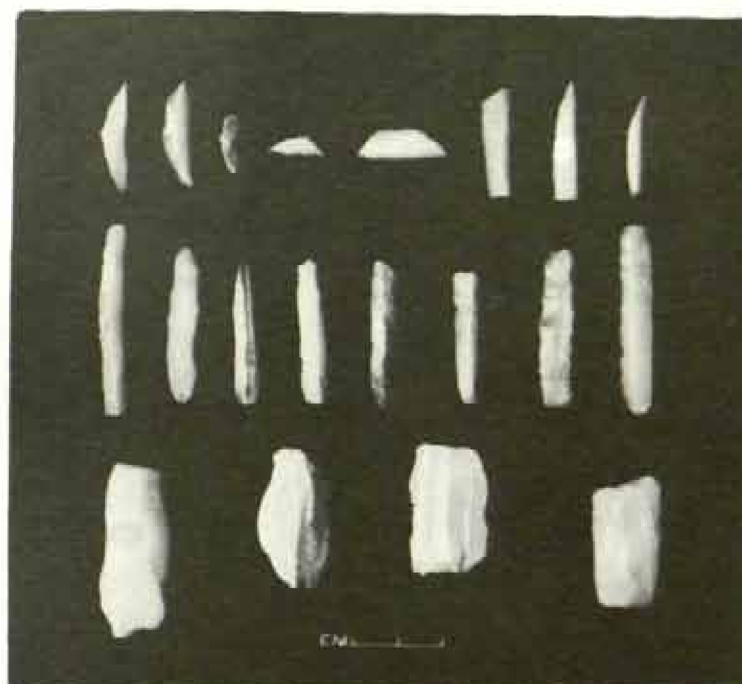


B

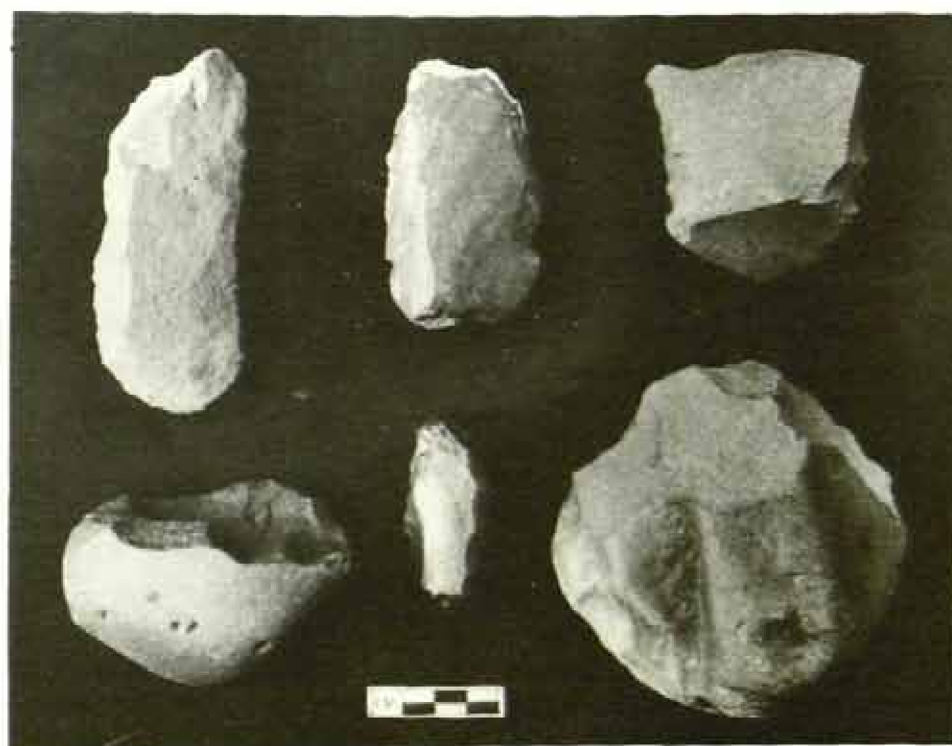


C

Utawad: A, *floor (phase II);* B, *butchering-cum-roasting spot and* C, *symbolic pot-burial.* *See p. 49*



A



B

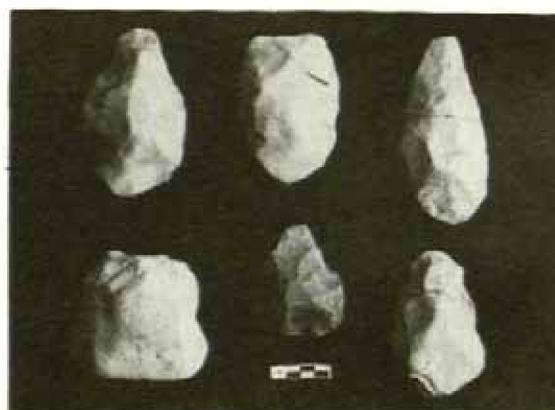
Utawad: A, microliths; B, heavy-duty stone artefacts. *See p. 50*



A



B

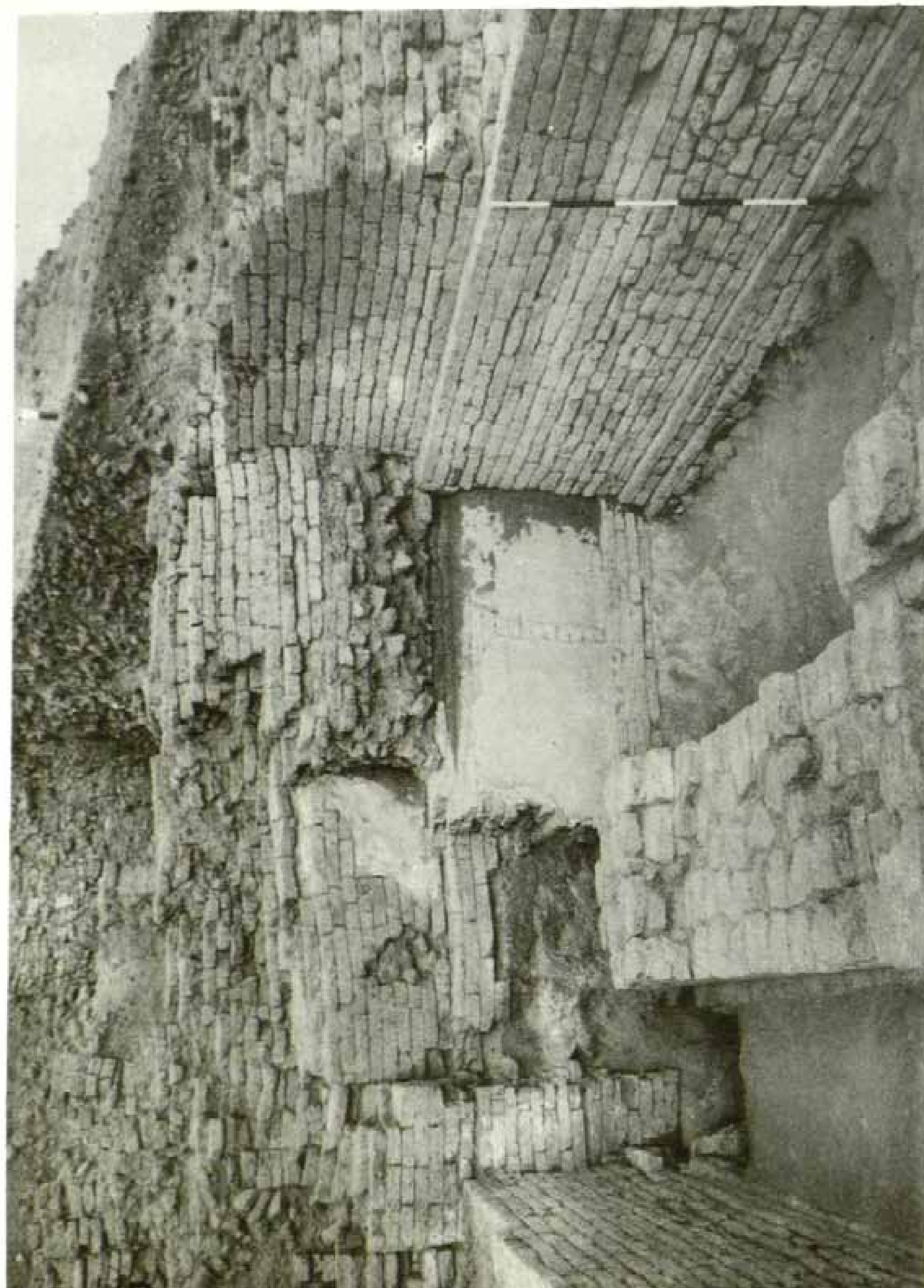


C

Utawad: A, high-level gravel deposit (arrow indicating Sosar-nallah); B, high-level gravel and C, Acheulian artefacts. *See p. 50*



Mansar: cutting on western slope. *See p. 56*



Mansar: cutting showing adhishthana raised over a knoll. *See p. 56*



Mansar: cutting showing western exterior of adhishthana. *See p.56*

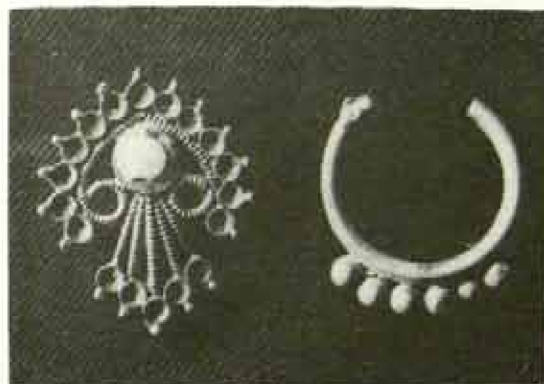


B

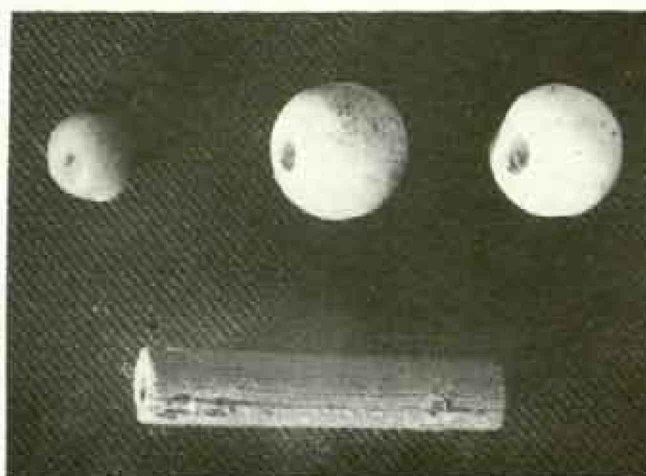


A

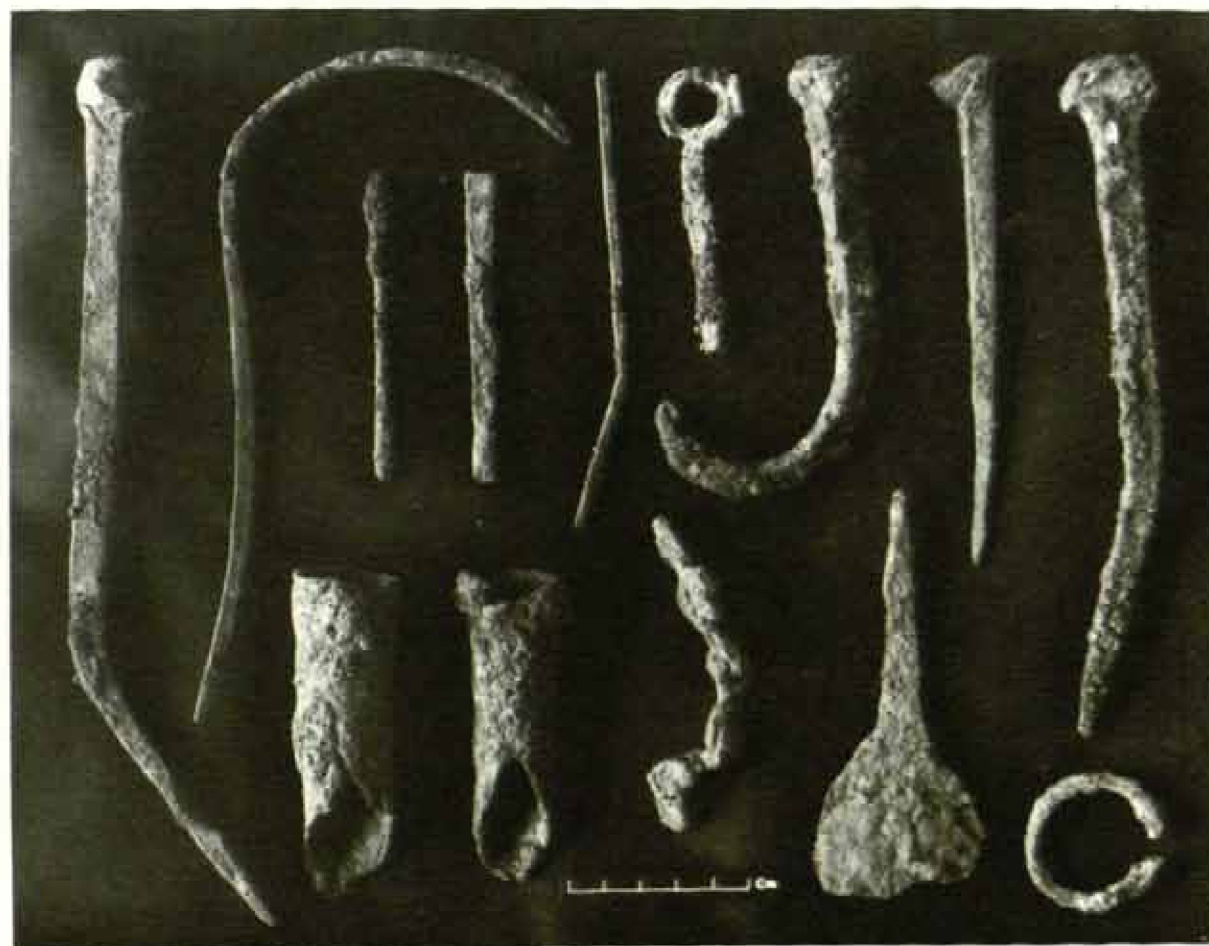
Mansar: A, soapstone plaque depicting padapitha; B, *head portion of a divine figure in clay.* *See p. 57*



A



B

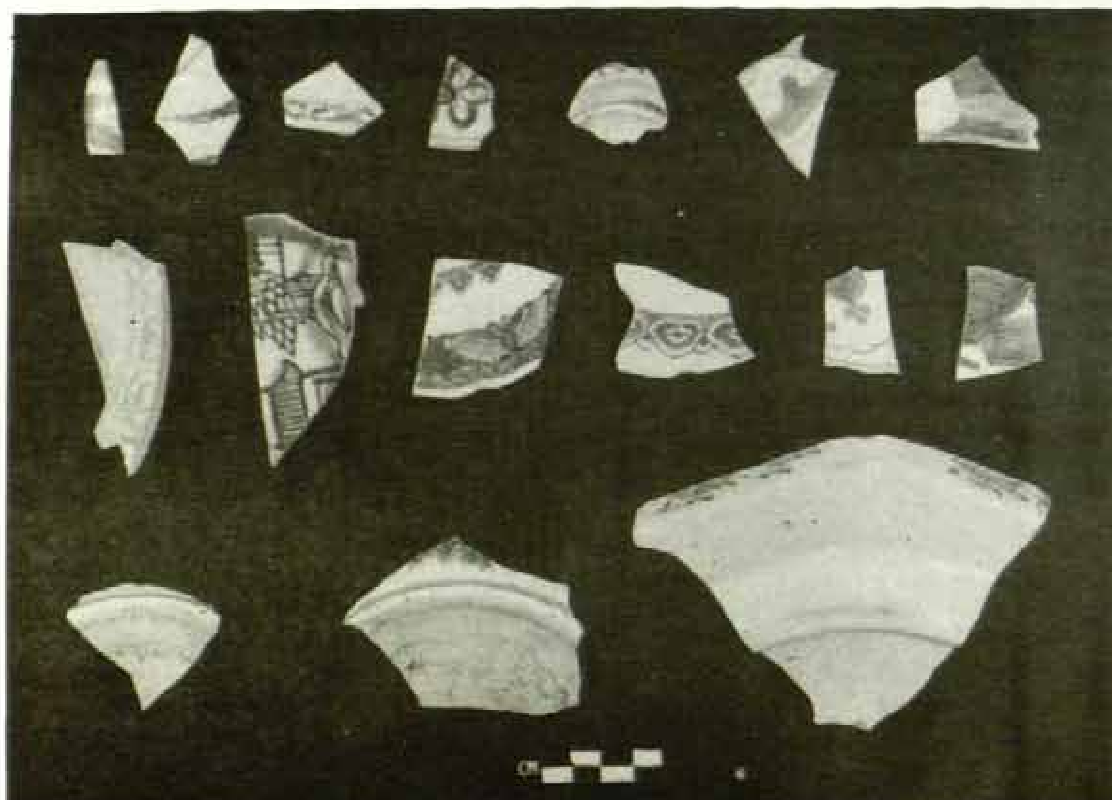


C

Mansar: A, silver ear-ring and stud; B, beads of silicious material; C, iron implements. *See p. 57*

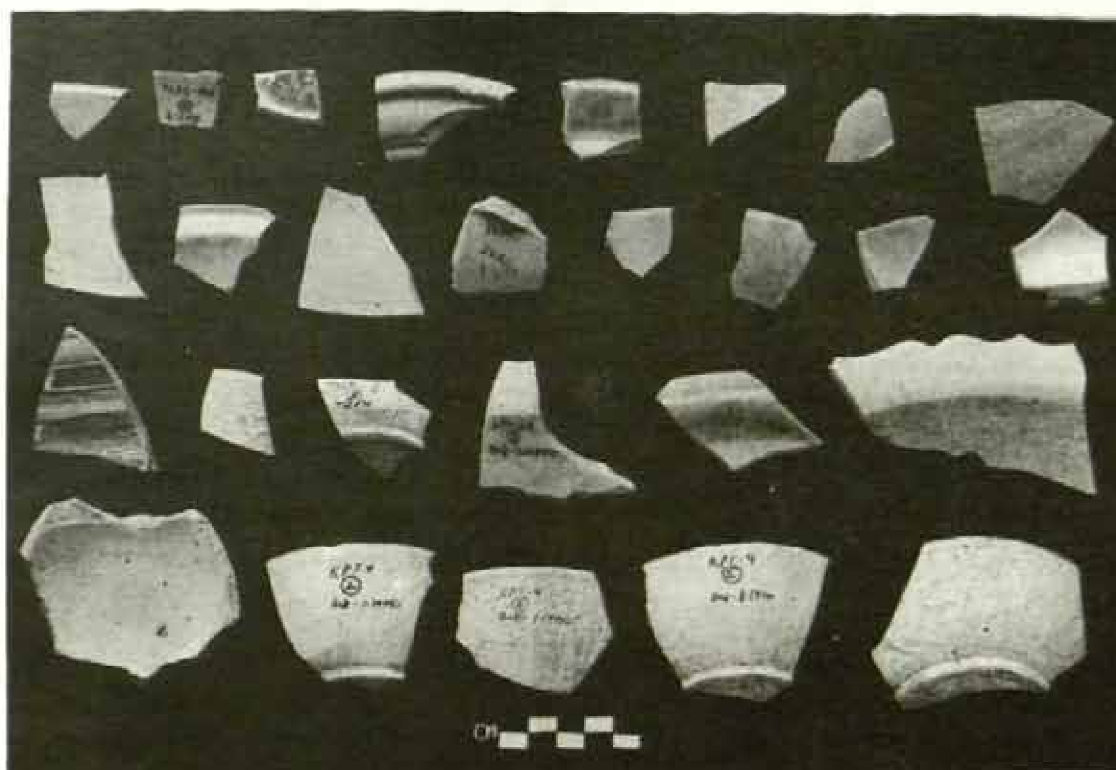


A



B

Barabati: A, *laterite structure with mouldings;* B, *shallow bowls of Chinese porcelain. See p.60*



A

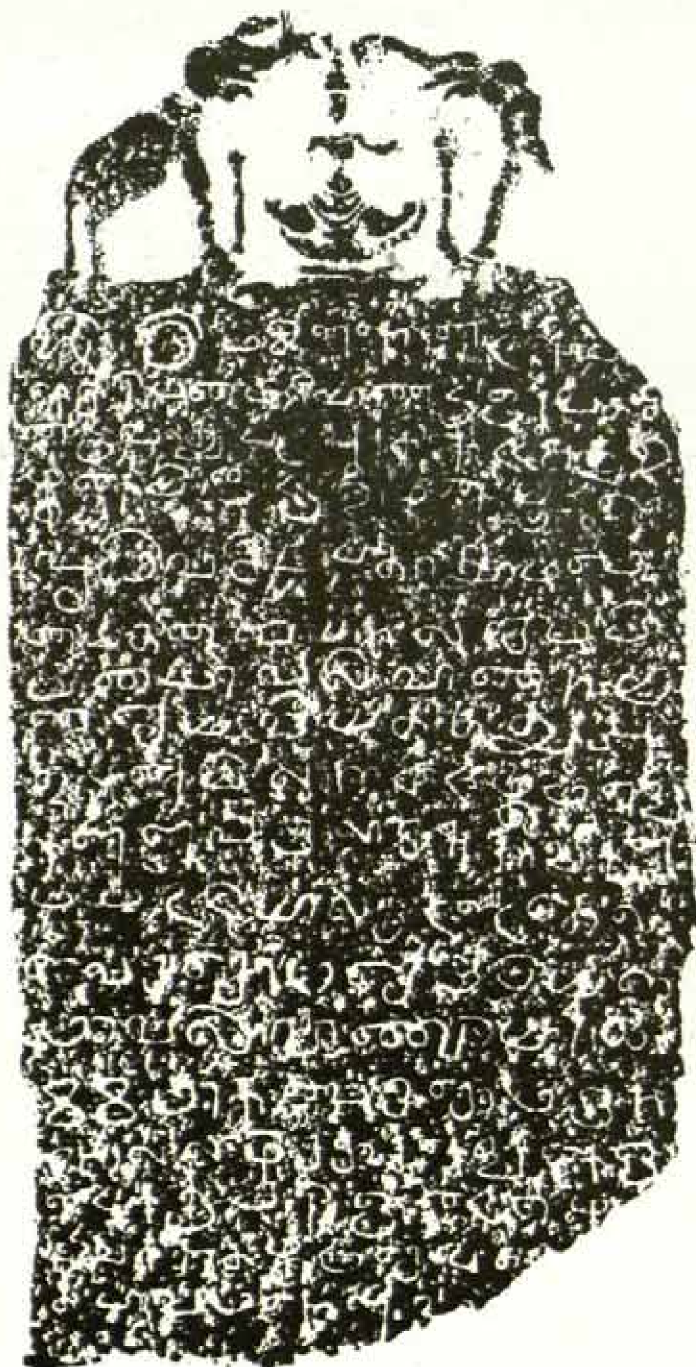


B

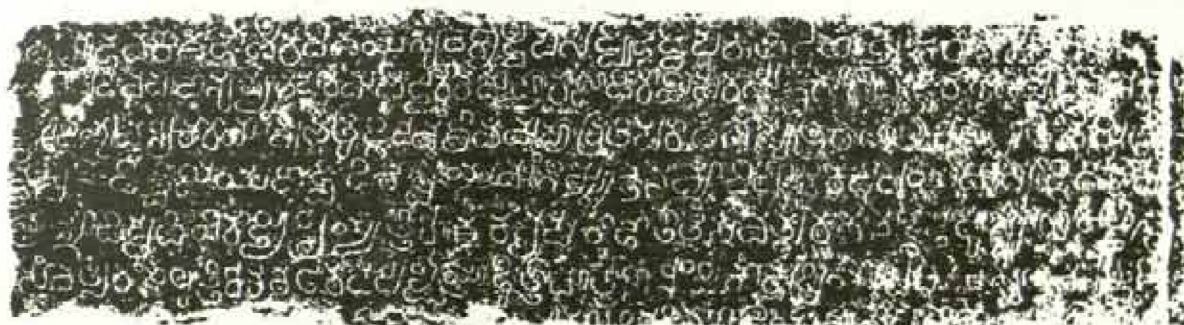
Khalkatapatana: A, *Chinese pottery;* B, *Madhipur: mithuna.* *See pp. 61 and 63*

Thiruvananthapuram: copper-plates of Panduvamsi king Mahasiva Tivararaja. *See p. 81*

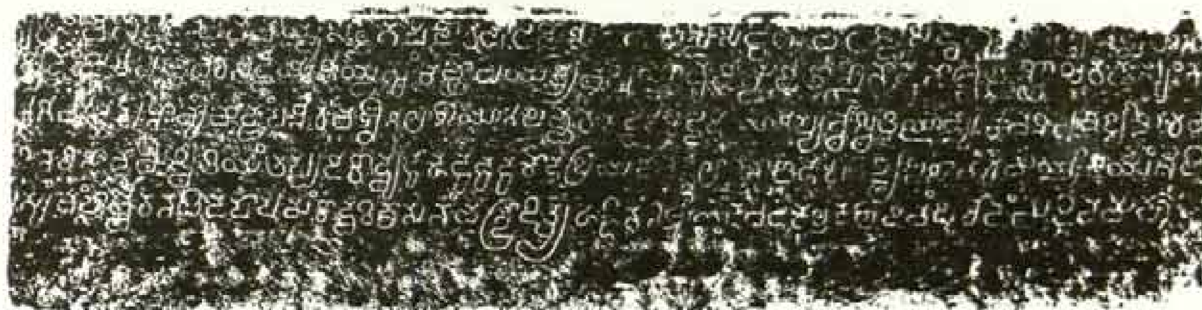
Thiruvananthapuram: copper-plates of Panduvamsi king Mahasiva Tivararaja. *See p. 81*



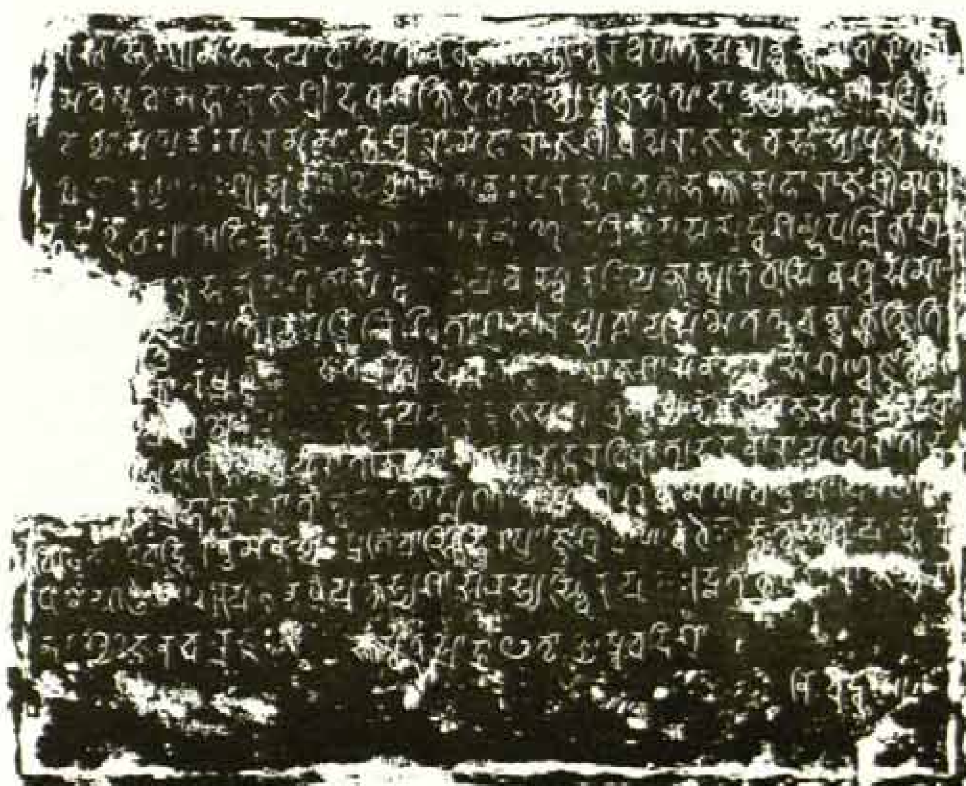
Olugaiyur: inscription of Parantaka Chola. *See p. 82*



A



B



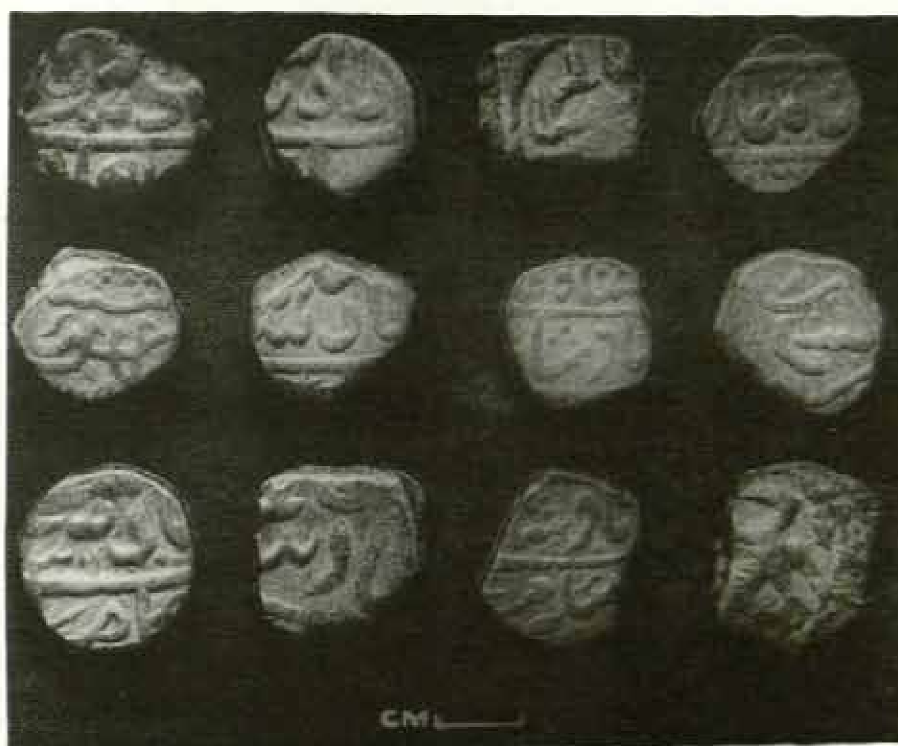
C

Tirumalaichcheri: A-B, Rashtrakuta inscription; C, Amroha: Pratihara copper-plate. *See pp. 82-83*

A

B

Kara: A, *Tughlaq inscription;* B, *late Mughal inscription.* *See p. 87*

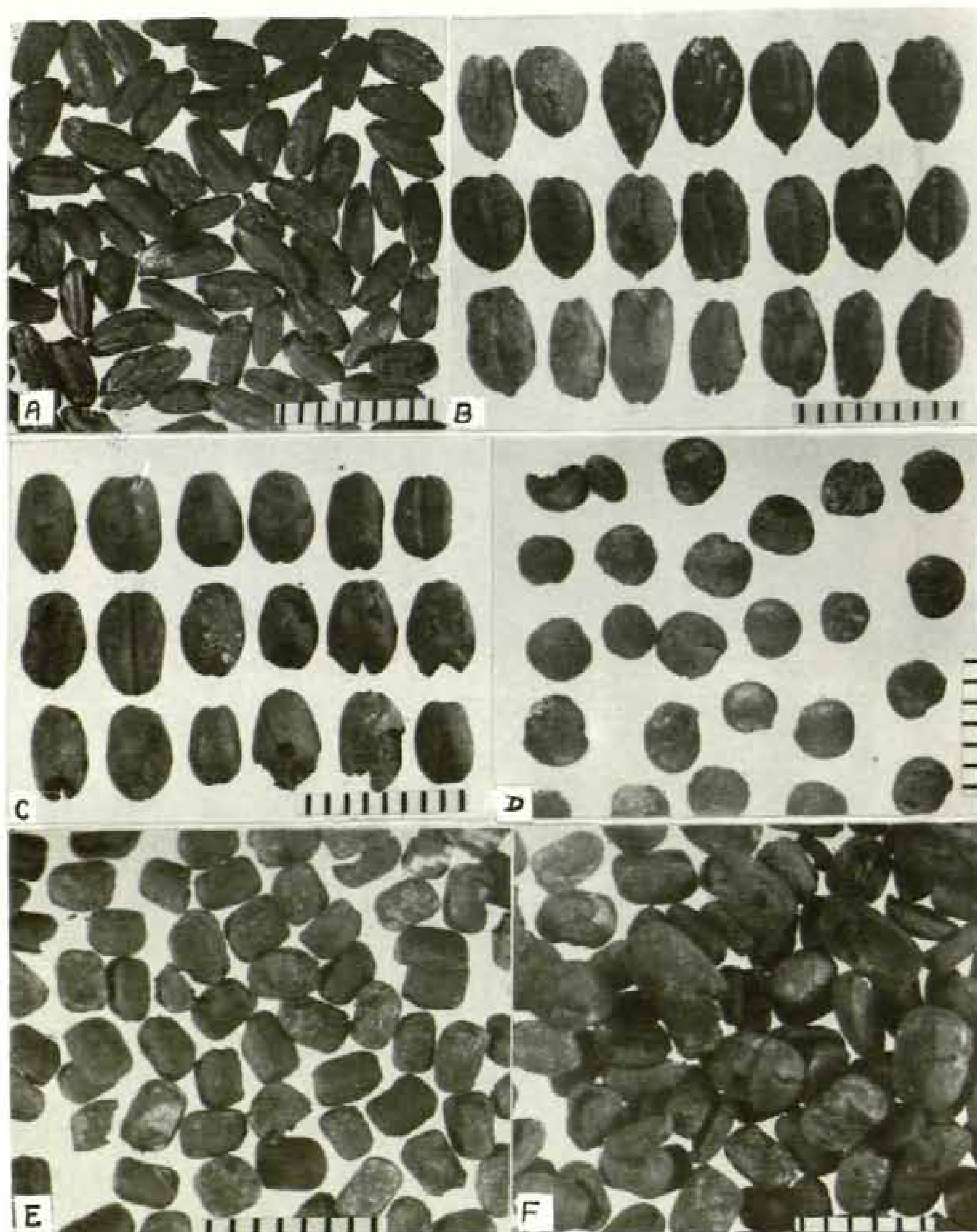


A

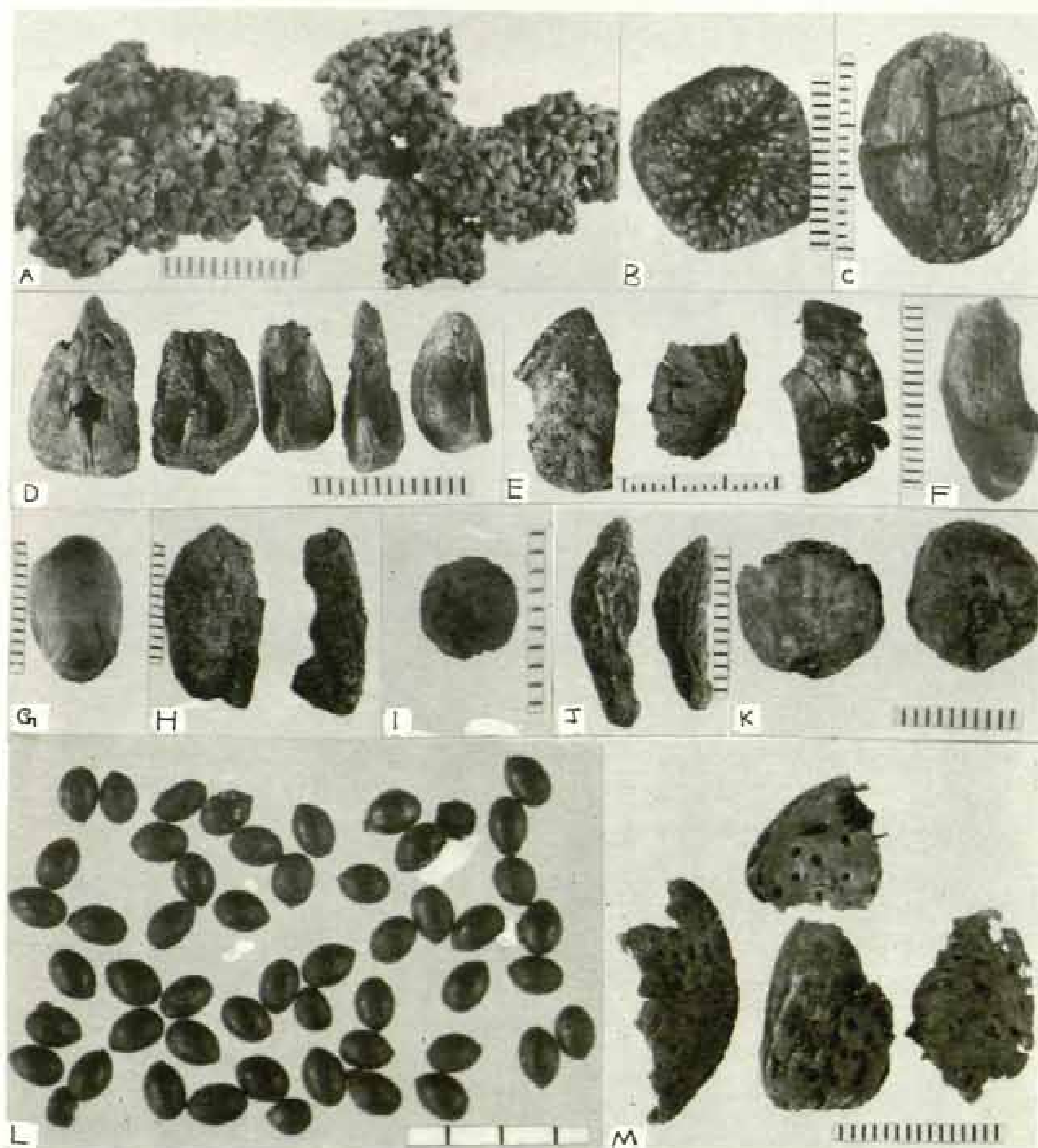


B

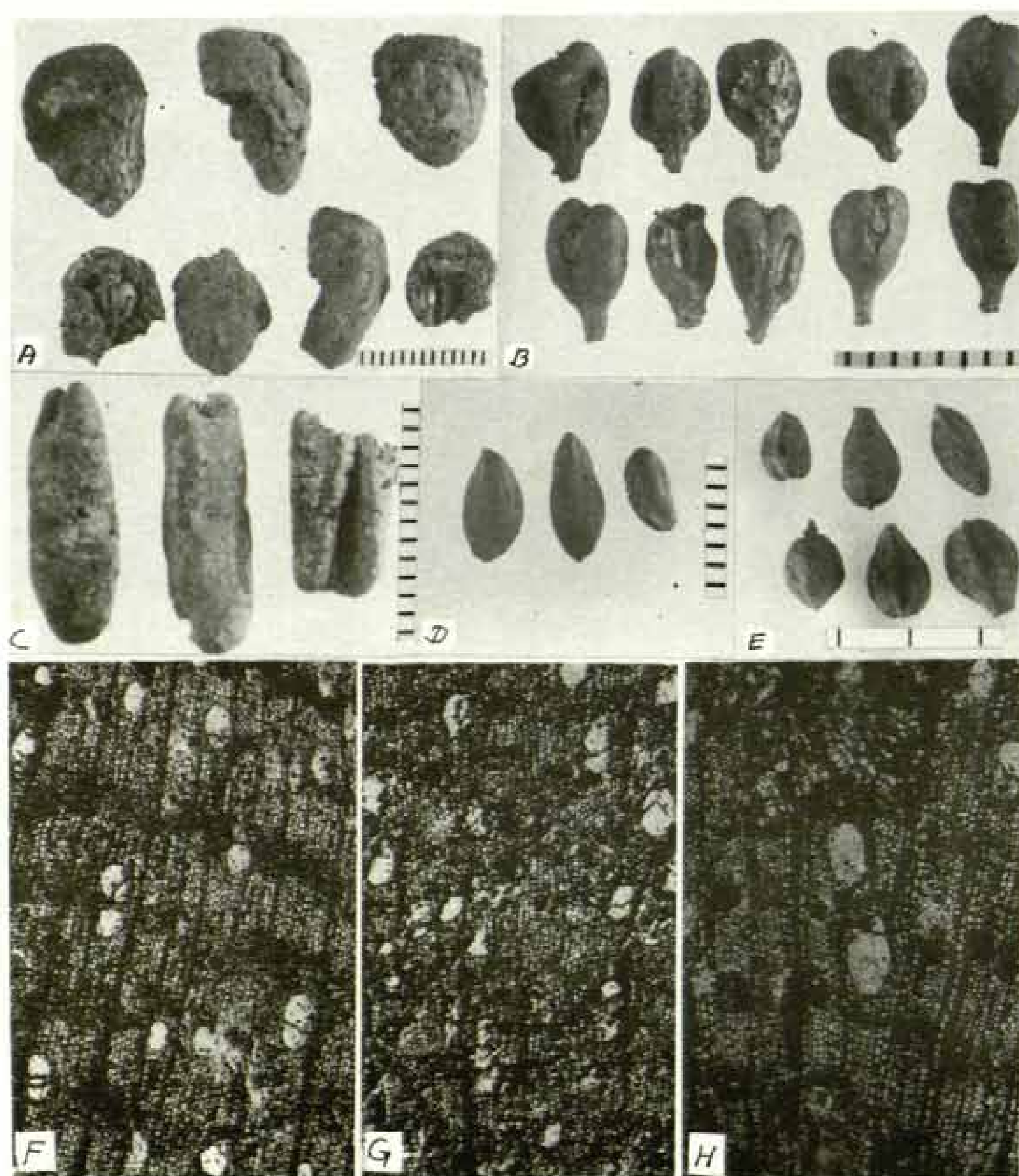
Pimpalgaon: copper coins, A, *obverse and* B, *reverse. See p. 89*



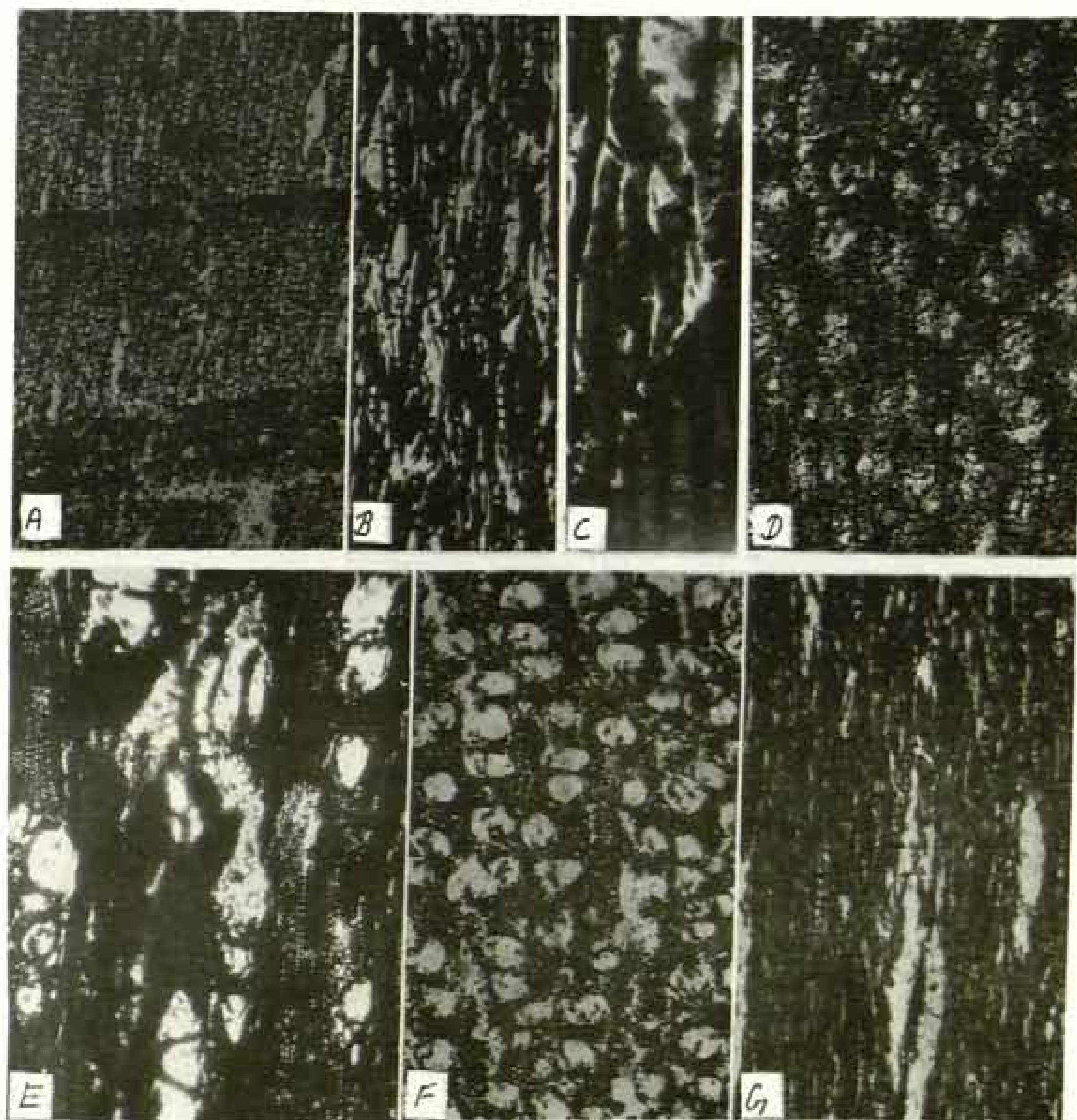
Sanghol: plant remains, A, *rice (oryza sativa);* B,*barley (hordeum vulgare);* C, *wheat (triticum aestivum);* D, *lentil (lens culinaris);* E, *green-gram/mung (vigna radiata);* F, *black-gram/urad (vigna mungo).* *See pp. 96-97*



Sanghol: plant remains, A, *til (sesamum indicum);* B, *gular-fig (ficus glomerata);* C, *jaiphal (myristica fragrans);* D, *Anwla (emblica officinalis) fruits-endocarp pieces;* E, *walnut/akhrot (juglans regia) fruit shell pieces;* F, *seed-shell of chilgoza (pinus gerardiana);* G, *pistachio-nut (pistacia cf. Vera);* H, *harra (terminalia chebula) fruit-pieces;* I, *black-pepper(piper nigrum);* J, *jujube (ziziphus mauritiana) stones;* K, *fruits of wild-jujube/jharberi(ziziphus nummularia);* L, *seeds of basil/tulsi (ocimum cf. sanctum);* M, *fruit-shell pieces of almond (prunus amygdalus).* *See p. 97*



Sanghol: plant remains, A, *raisin/draksha (vitis vinifera);* B, *seeds of raisins;* C, *stones of date (phoenix sp.);* D, *seeds of khanda/phok (ephedra sp.); E, seeds of a wild grass (cyperus sp.);* F, *wood charcoal of pipal (ficus religiosa), x 40;* G, *wood charcoal of gular (ficus glomerata), x 40;* H, *wood charcoal of palash (butea monosperma), x 40.* *See p. 97*



Sanghol: plant remains, A-C, *wood charcoal of deodar (cedrus deodara);* D, *wood charcoal of tamal/camphor type;* E, *wood charcoal of kaith (feronia limonia);* F-G, *wood charcoal of sandal/chandan (santalum album).* *See p. 97*



A



B

A, *Mathura Museum: inscribed image of Bodhisattva;* and B, *view of Napier Museum. See pp. 100 and 102*



A

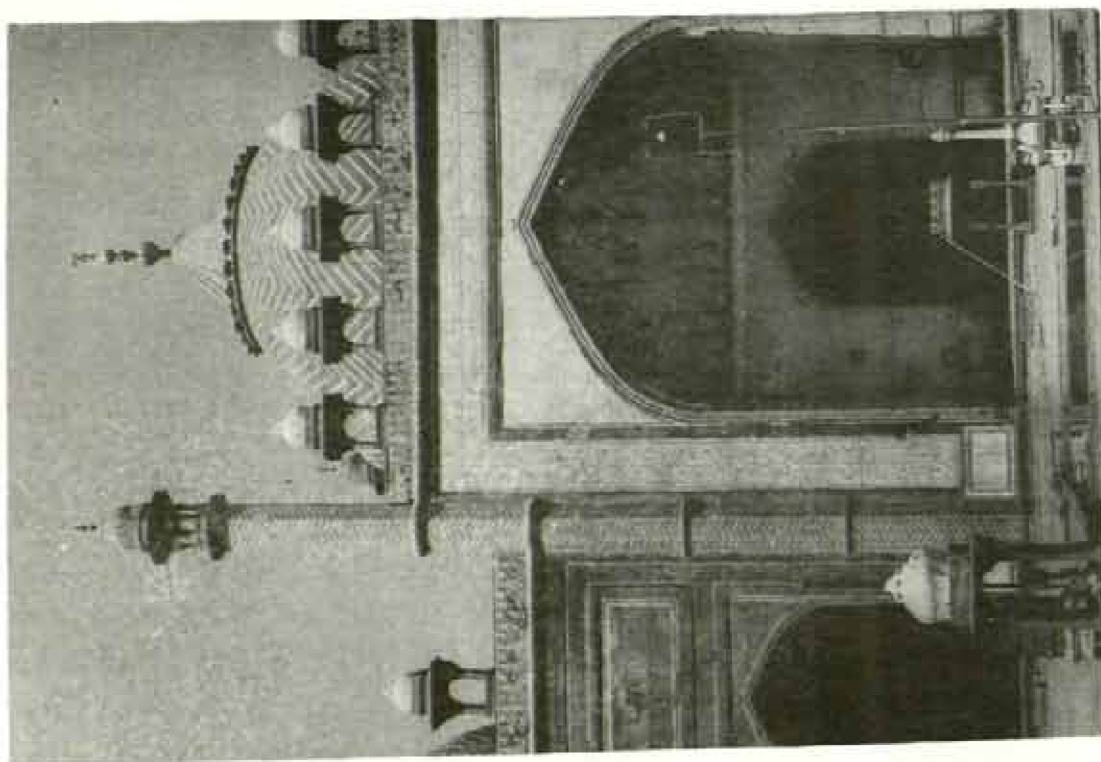


B

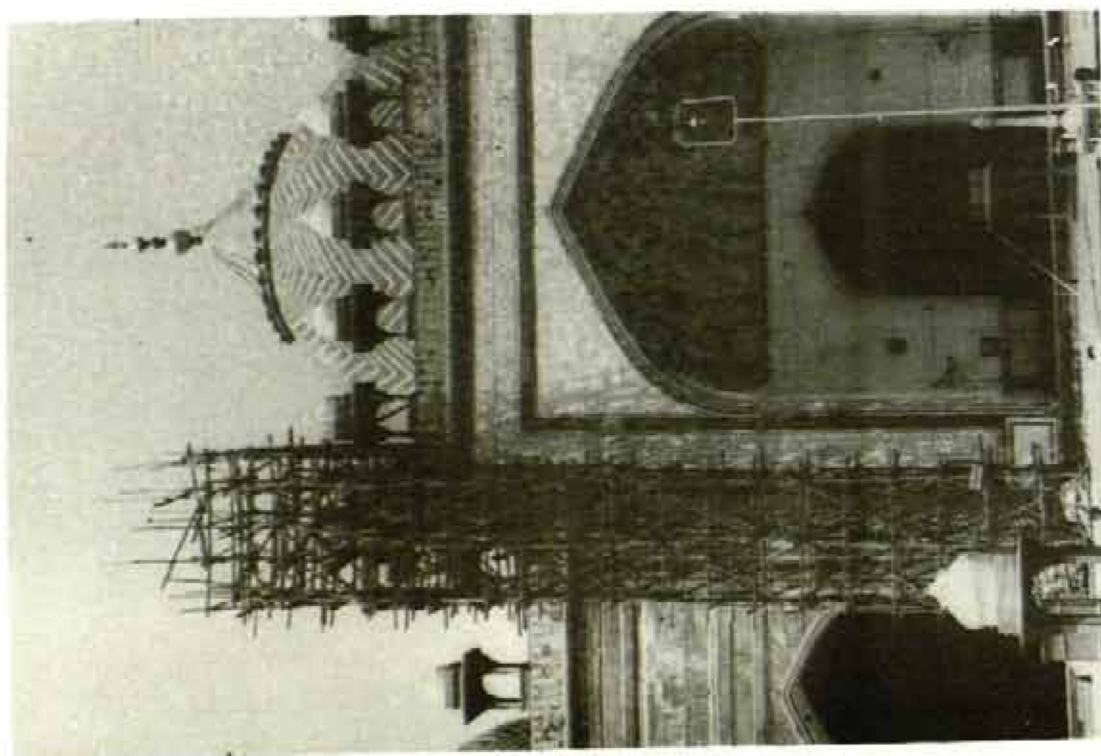


C

Vrindavan: A, *Keshighat and Lakshmikunj;* B, *Vihar ghat;* C, *Chhatri. See pp. 103-104*

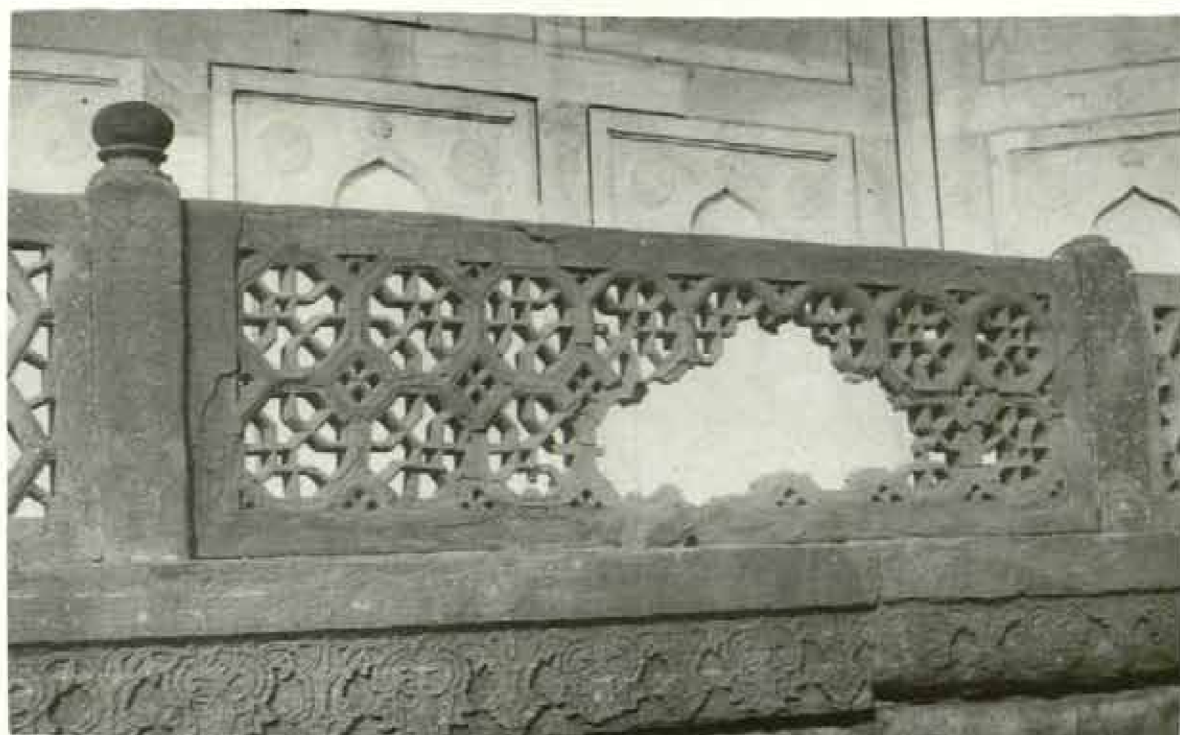


B

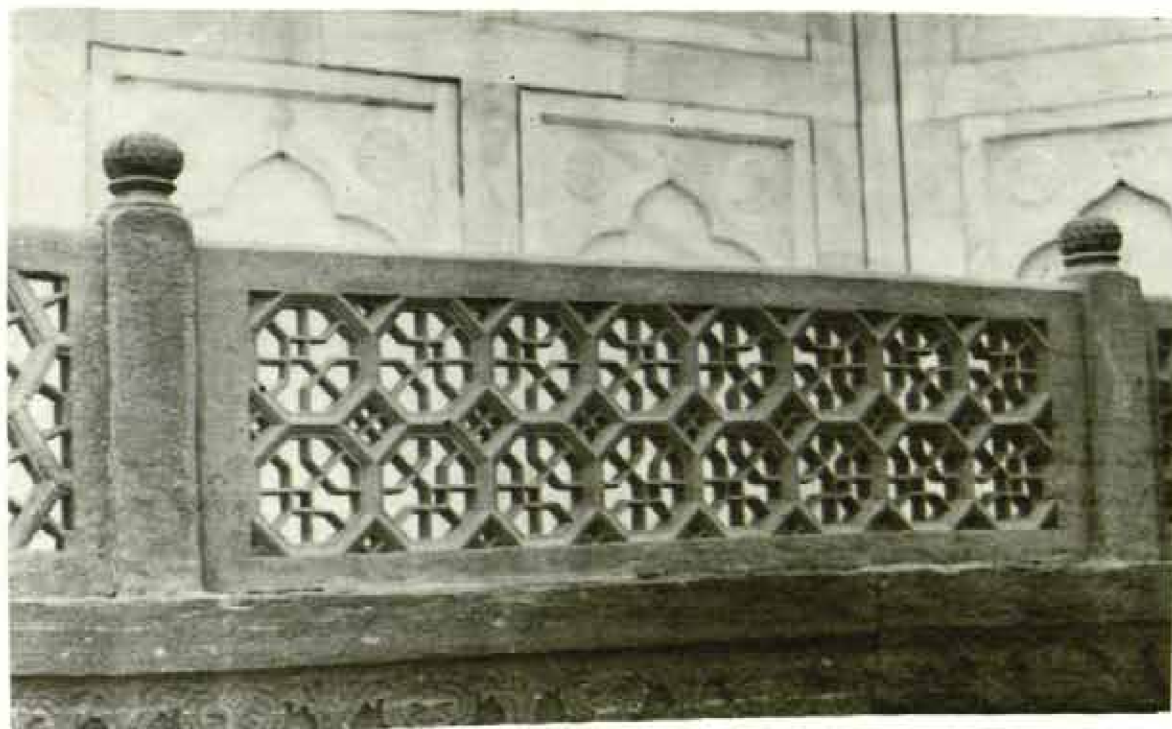


A

Agra: Jama Masjid, southeastern corner minar, A, during and B, after conservation. *See p. 105*

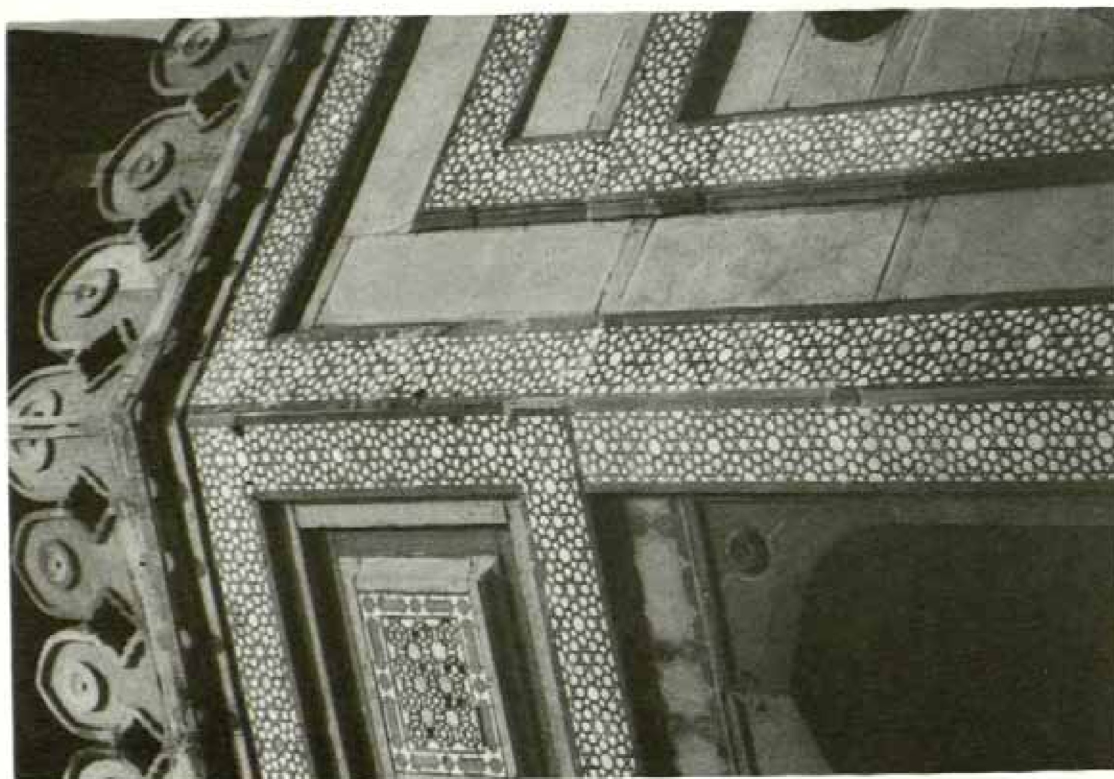


A

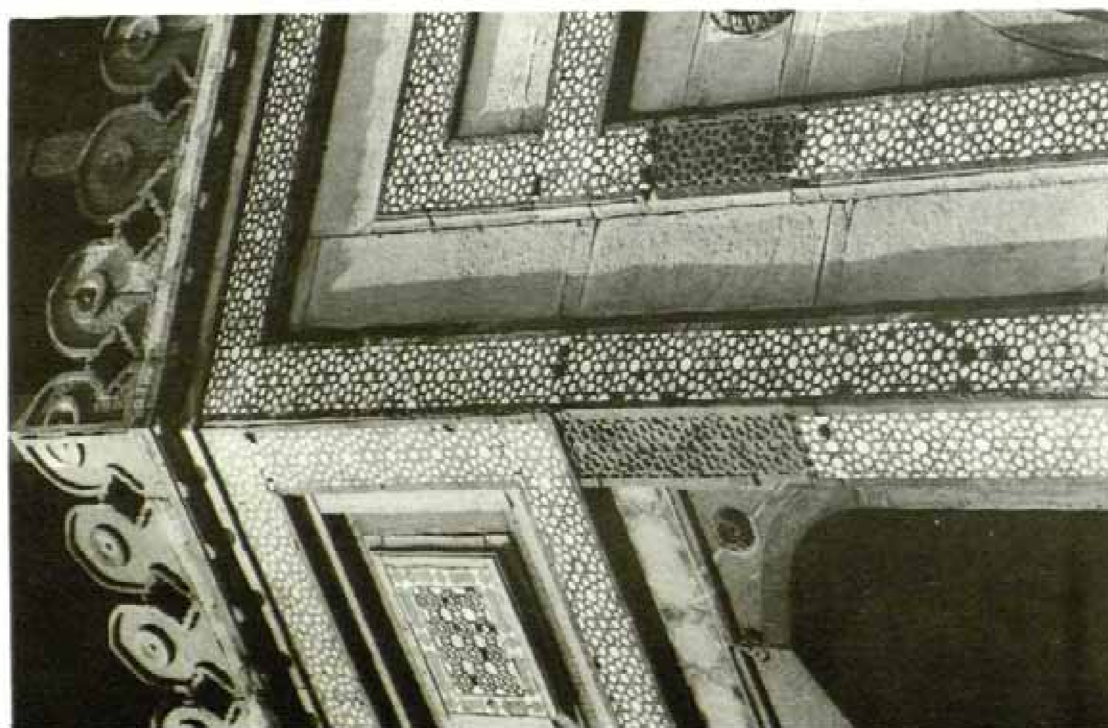


B

Agra: Taj Mahal, broken red sandstone, A, *before and* B, *after conservation.* *See p. 106*

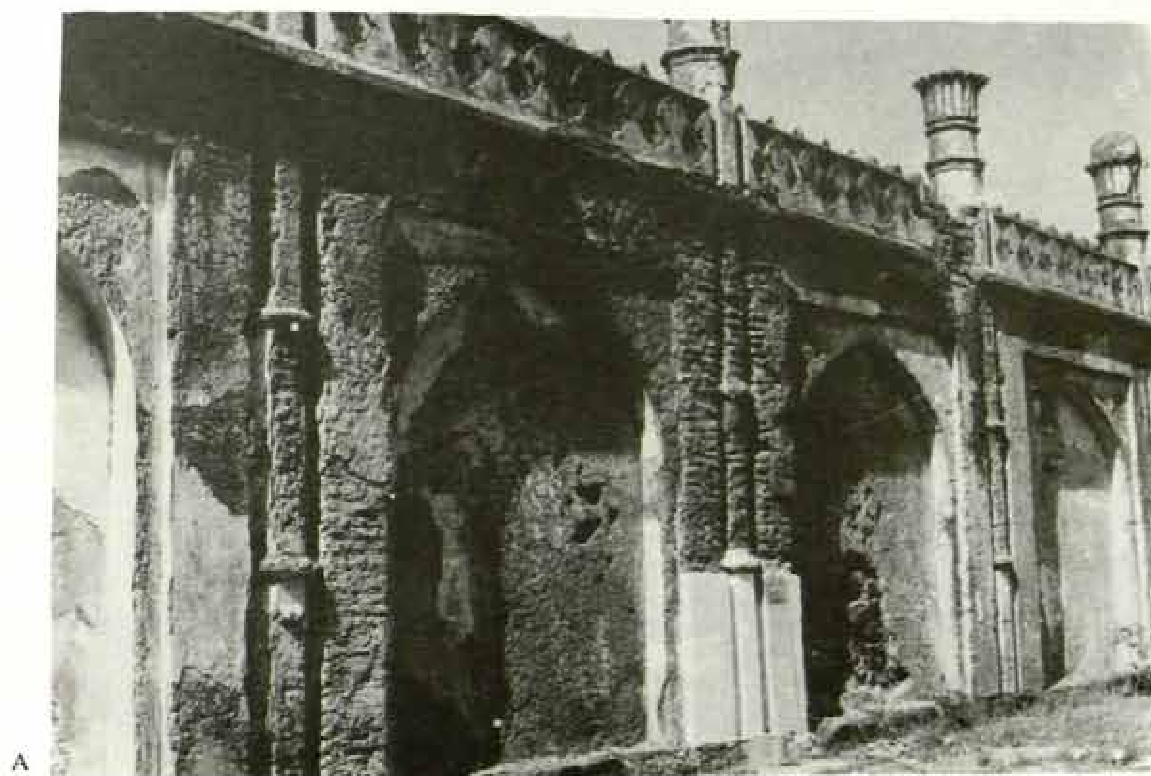


B

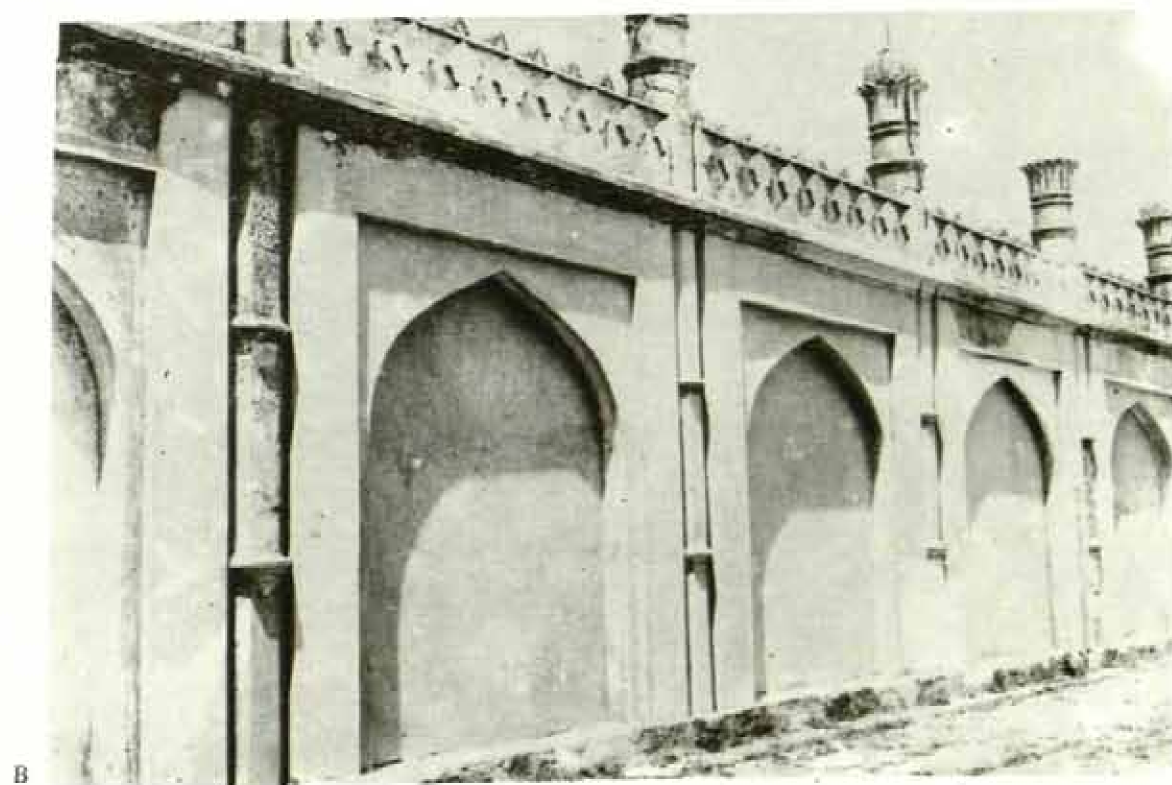


A

Fatehpur Sikri: Badshahi Gate, white marble inlay-work, A, before and B, after conservation. *See p. 107*



A



B

Aurangabad: Bibi-ka-Maqbara, compound-wall, A, *before and* B, *after conservation.* *See p. 107*



A



B

Kamalapuram: Ranga Temple, sunken, fallen and dislodged members, A, *before and* B, *after conservation. See p. 109*



A



B

Krishnapuram: Krishna Temple, cloister-mandapa, A, *before and* B, *after conservation.* *See p. 110*



A



B

Barsoor: Chandraditya Temple, A, *before and* B, *after conservation. See p. 114*

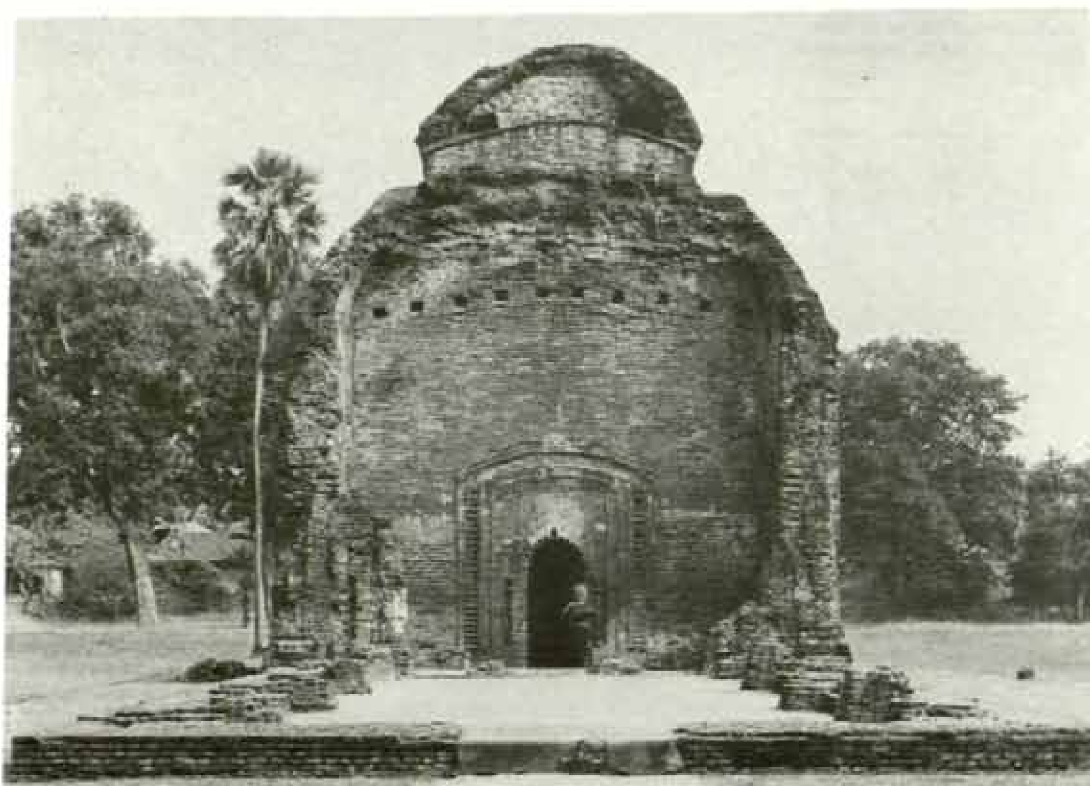


A



B

Ratanpur: Kanti Deul, A, before dismantling and B, after restoration upto the first floor. *See p. 114*

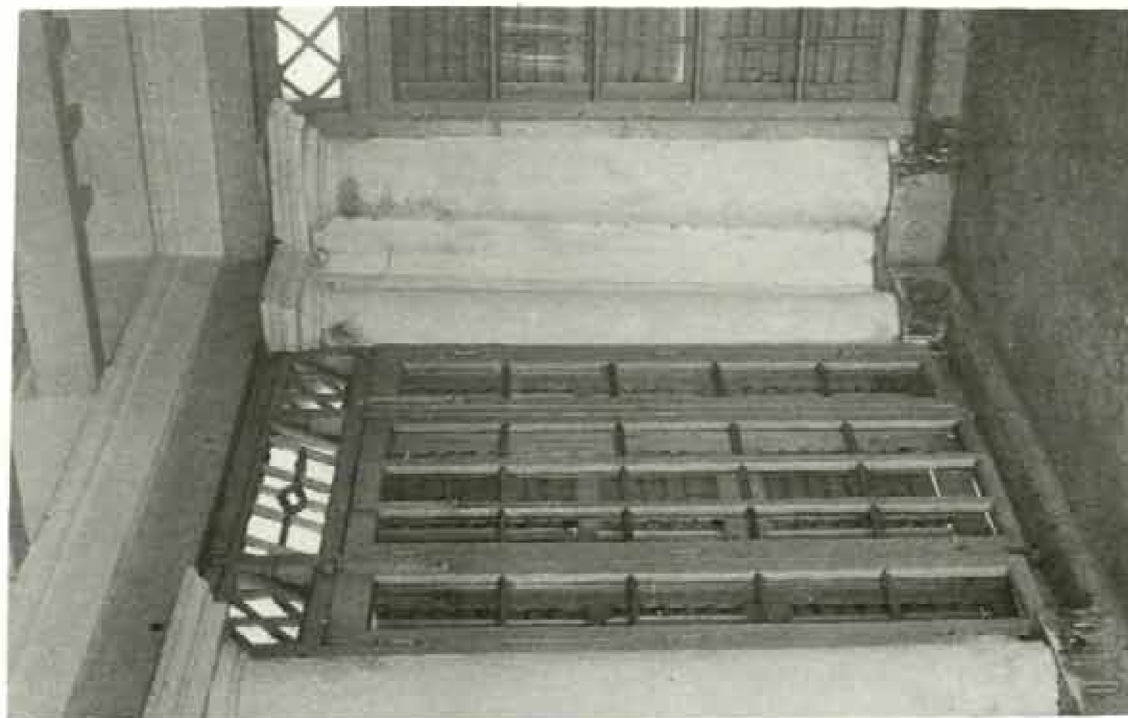


A

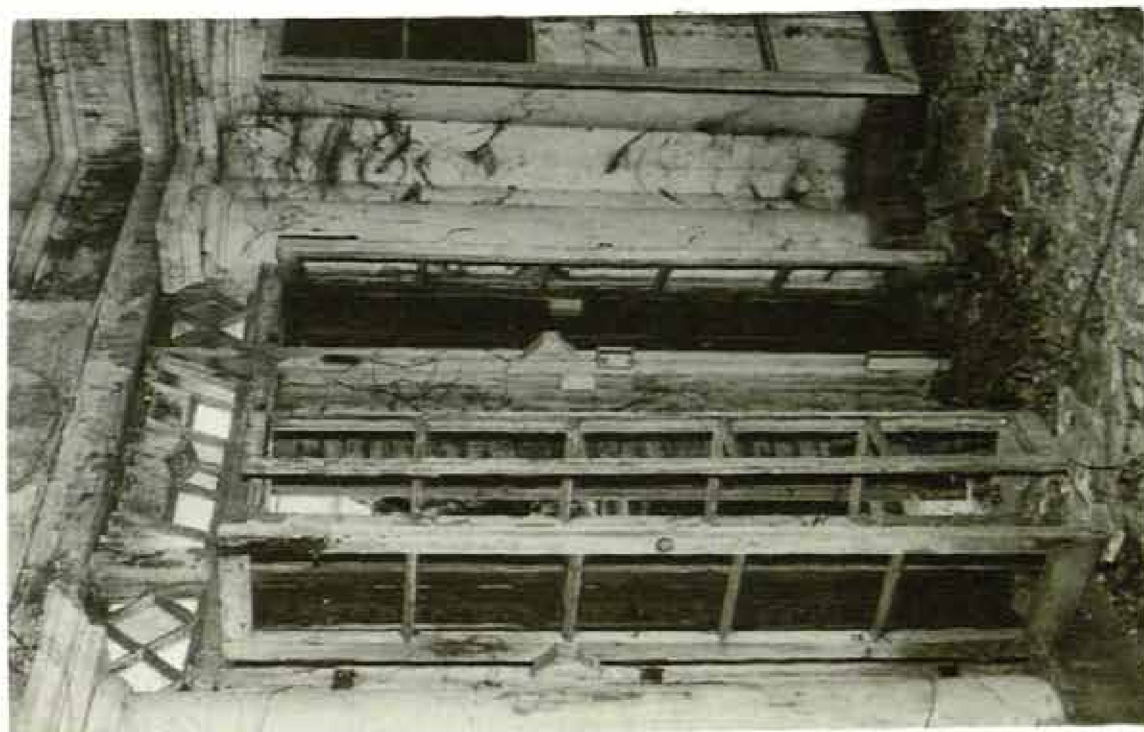


B

Haripurgarh: Rasika Raya Temple, A, *before and* B, *after conservation. See p. 116*

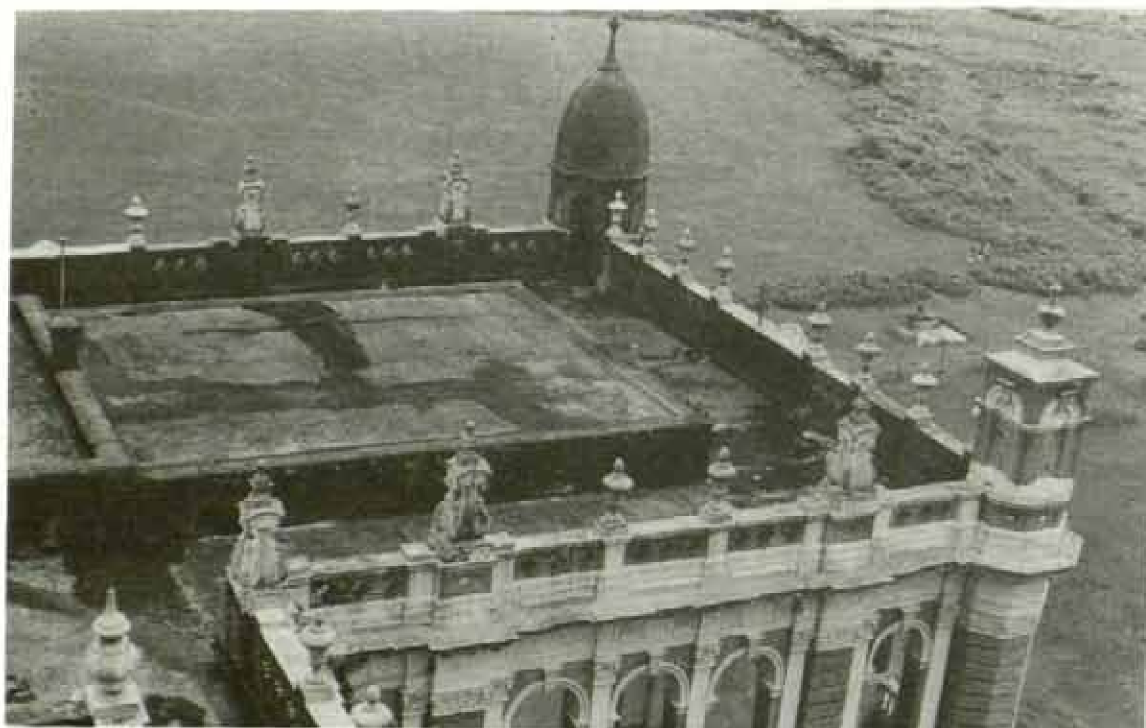


B



A

Jorasanko: Maharshi Bhavan, wooden doors, A, before and B, after repairs. *See p. 117*



A



B

Cooch Behar: Cooch Behar Palace, A, before, B, after conservation of roof. *See p. 117*

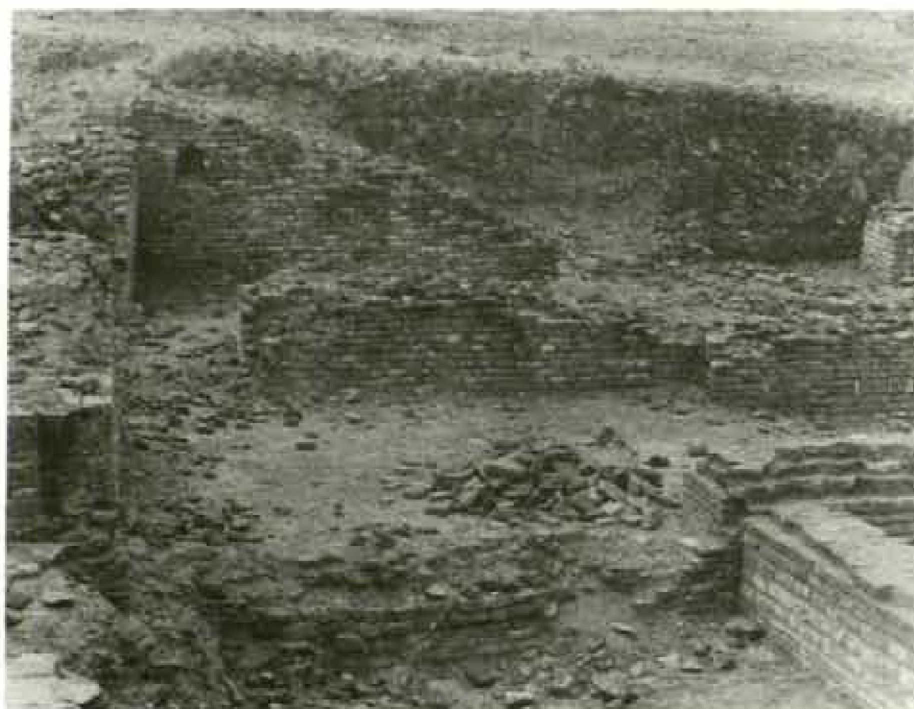


A



B

Agroha: Buddhist stupa remains, A. *before and* B, *after conservation.* *See p. 118*

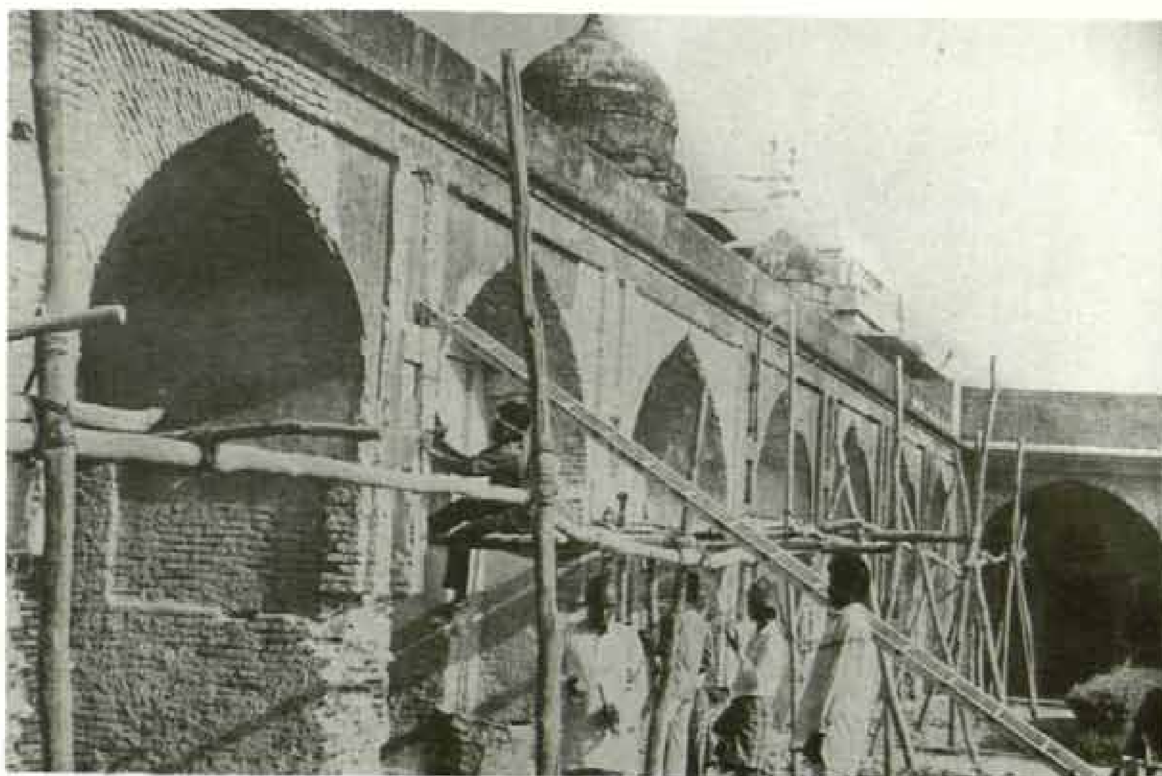


A

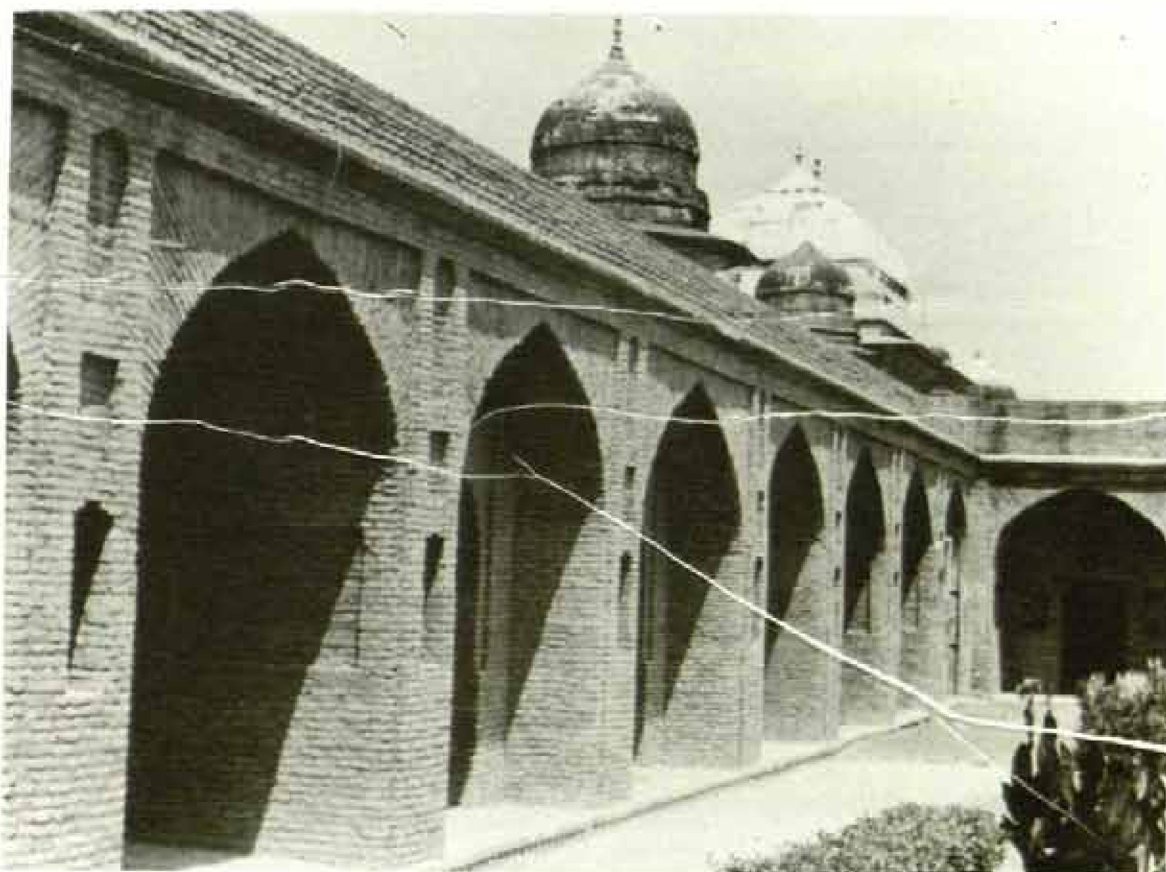


B

Thanesar: Raja Harsh-Ka-Tila, excavated area, TS 2, A, before and B, *after conservation.* *See p. 118*



A



B

Thanesar: Tomb of Sheikh Chilli, cells, A, before and B, after conservation. *See p. 118*

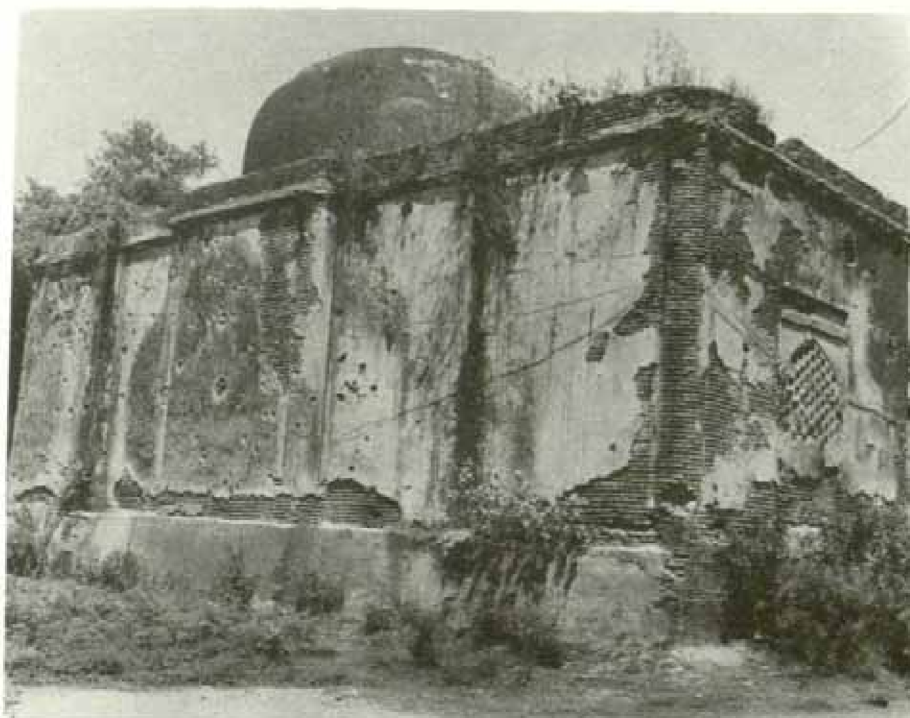


A

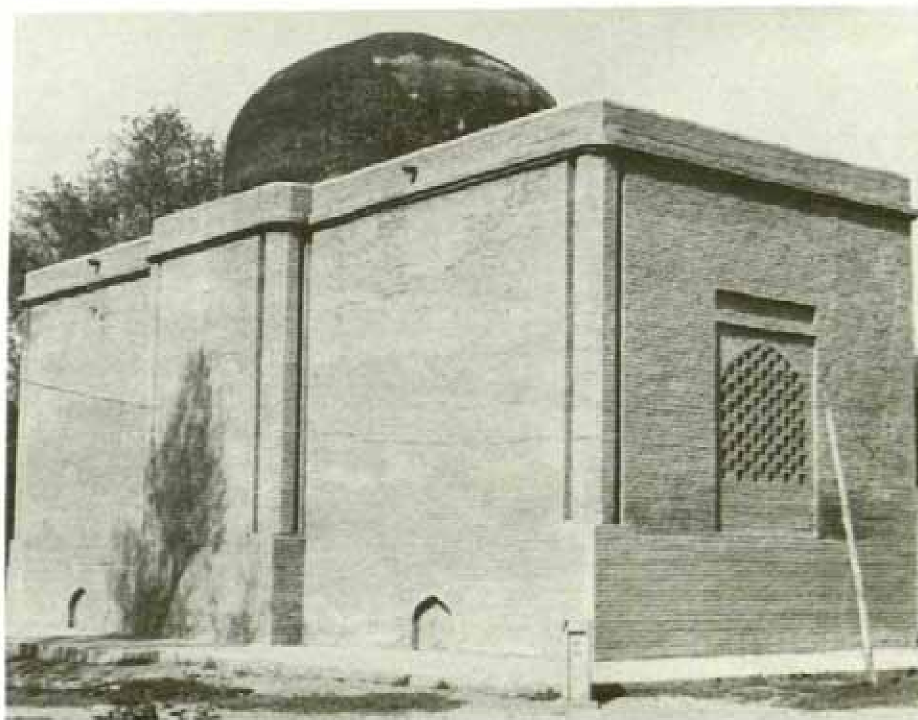


B

Baijnath: Sidhnath Temple, A, before and B, after conservation. *See p. 118*



A



B

Noor Mahal Sarai: Mosque, A, *before and* B, *after conservation.* *See p. 119*



A

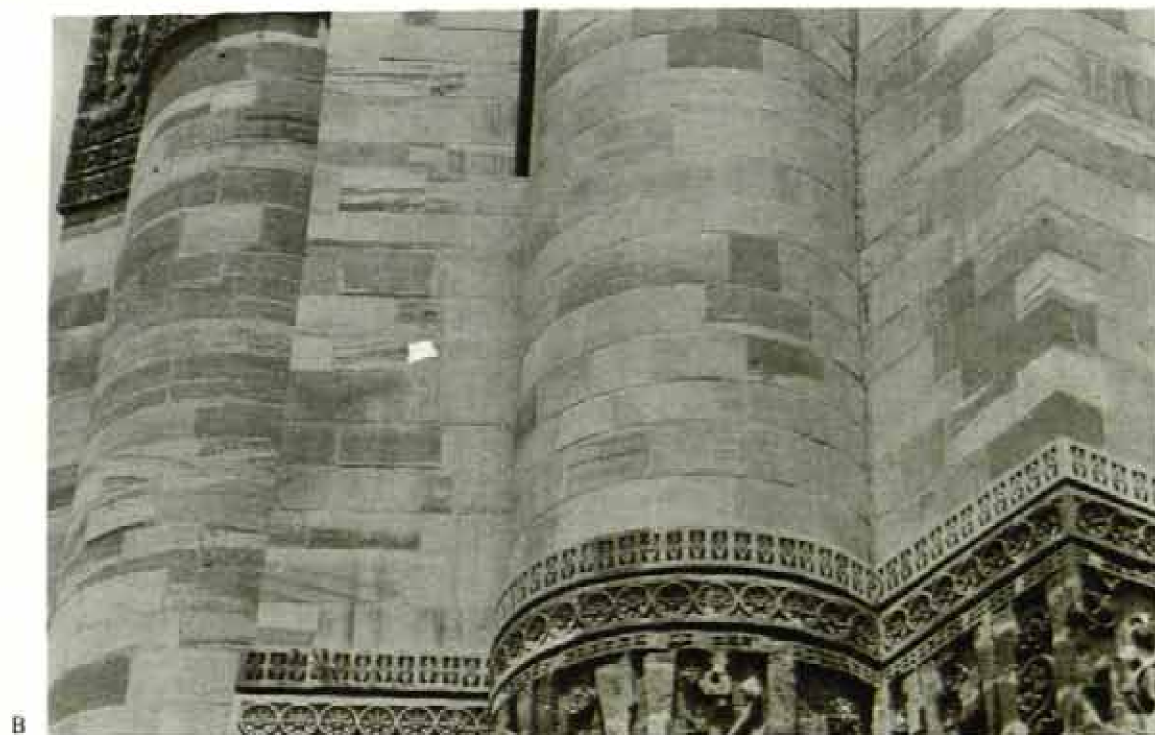


B

Red Fort: Rang Mahal, A, before and B, after restoration of the fountains. *See p. 119*



A



B

Delhi: Qutb Minar, A, before and B, after restoration of decayed, worn-out veneering stones. *See. p.119*



A

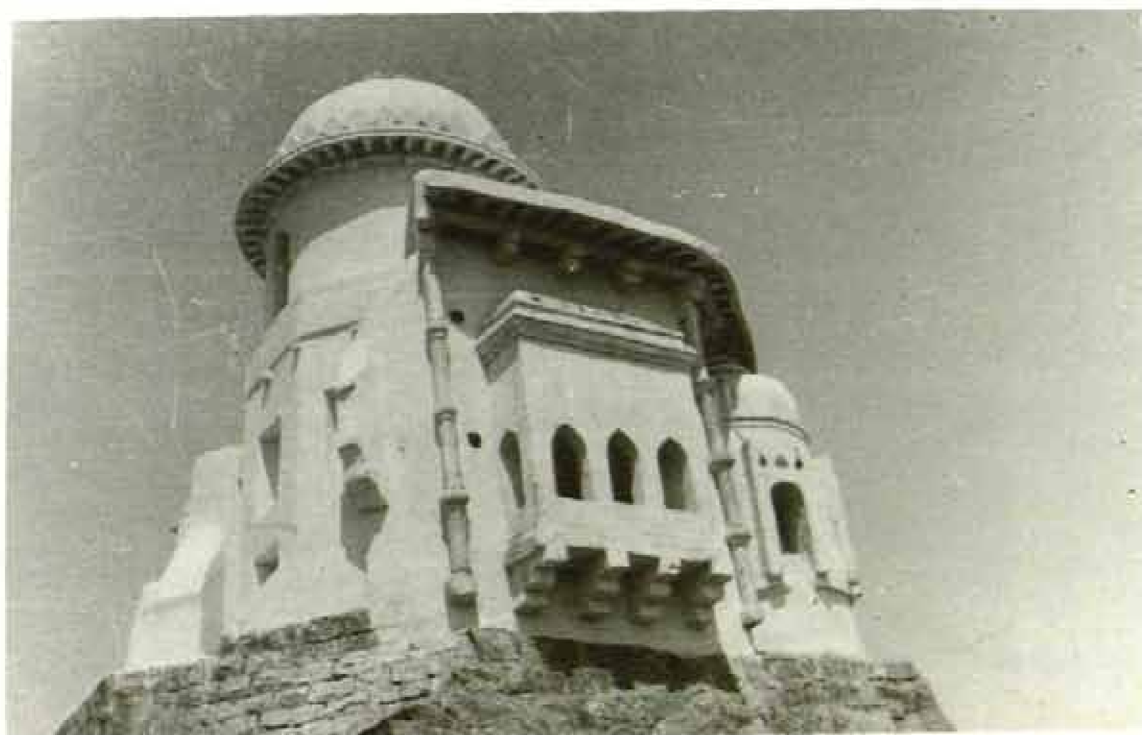


B

Delhi: Tughlaqabad Fort, bastion, A, *before and* B, *after restoration.* *See p. 120*



A



B

Penukonda: Rama's Bastion, A, before and B, after conservation.. See p. 120



A



B

Nagarjunakonda: Bathing Ghat, A, before and B, after conservation. *See p. 121*



A



B

Kumbhalgarh Fort: Golerao Temple 2, A, before and B, after restoration. *See p. 124*



A



B

Ariyur: Siva Temple, A, *before and* B, *after removal of vegetation.* *See p. 129*



A



B

Nangupatti: Tiruperumanandar Temple, vasanta-mandapa, A *before and* B, *after conservation.* *See p. 129*



A



B

Irumbanadu: Siva Temple, dislodged pada, A, *before and* B, *after restoration.* *See p. 129*

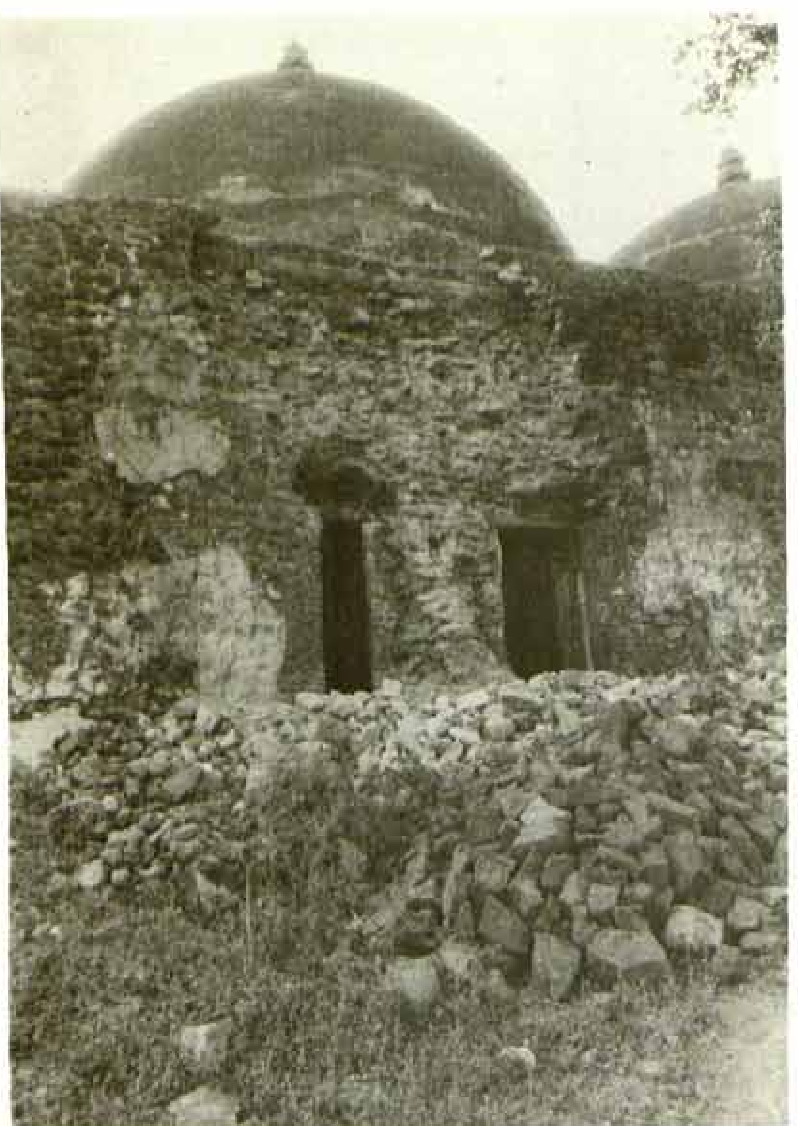


A

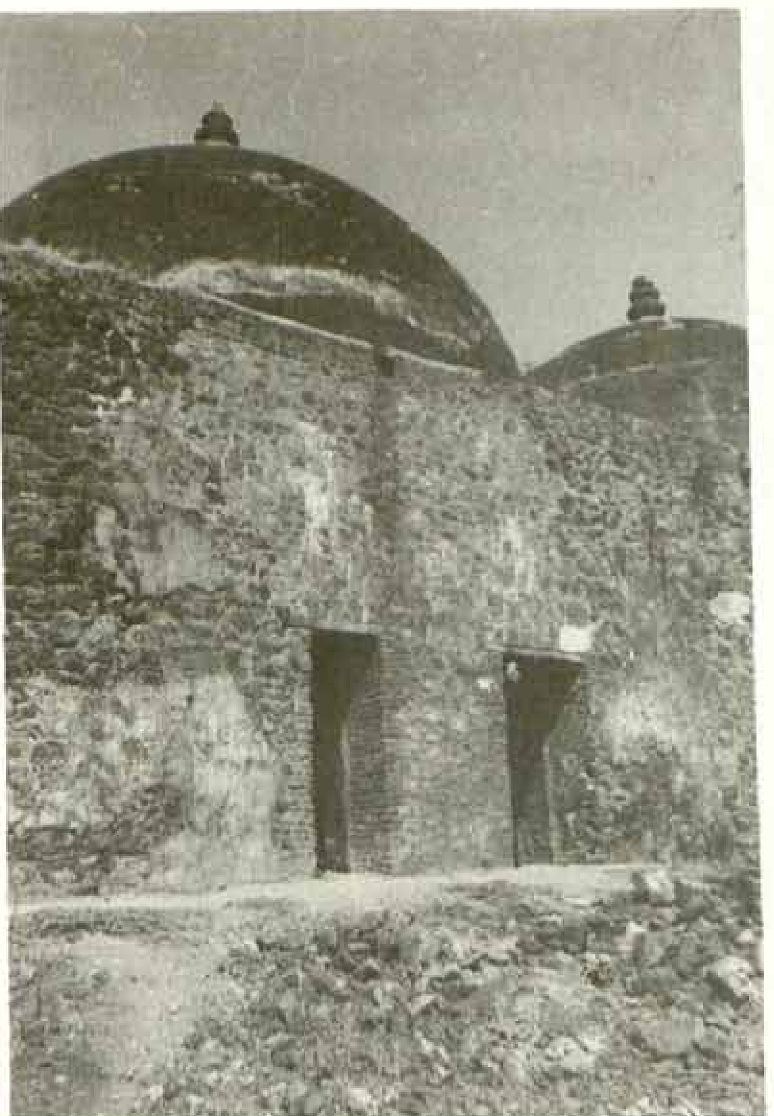


B

Gingee: Krishna Temple, A, before and B, after conservation. *See p. 130*



A



B

Pavagadh Hill: Makai Kothar, A, before and B, after conservation. *See p. 133*



A



B

Chandragiri Museum: metal image, A, before and B, after chemical treatment. *See p. 136*



B



A

Rani-Ki-Vav: stone sculptures and ornamental carvings, A, before and B, after chemical treatment. *See p. 140*



A

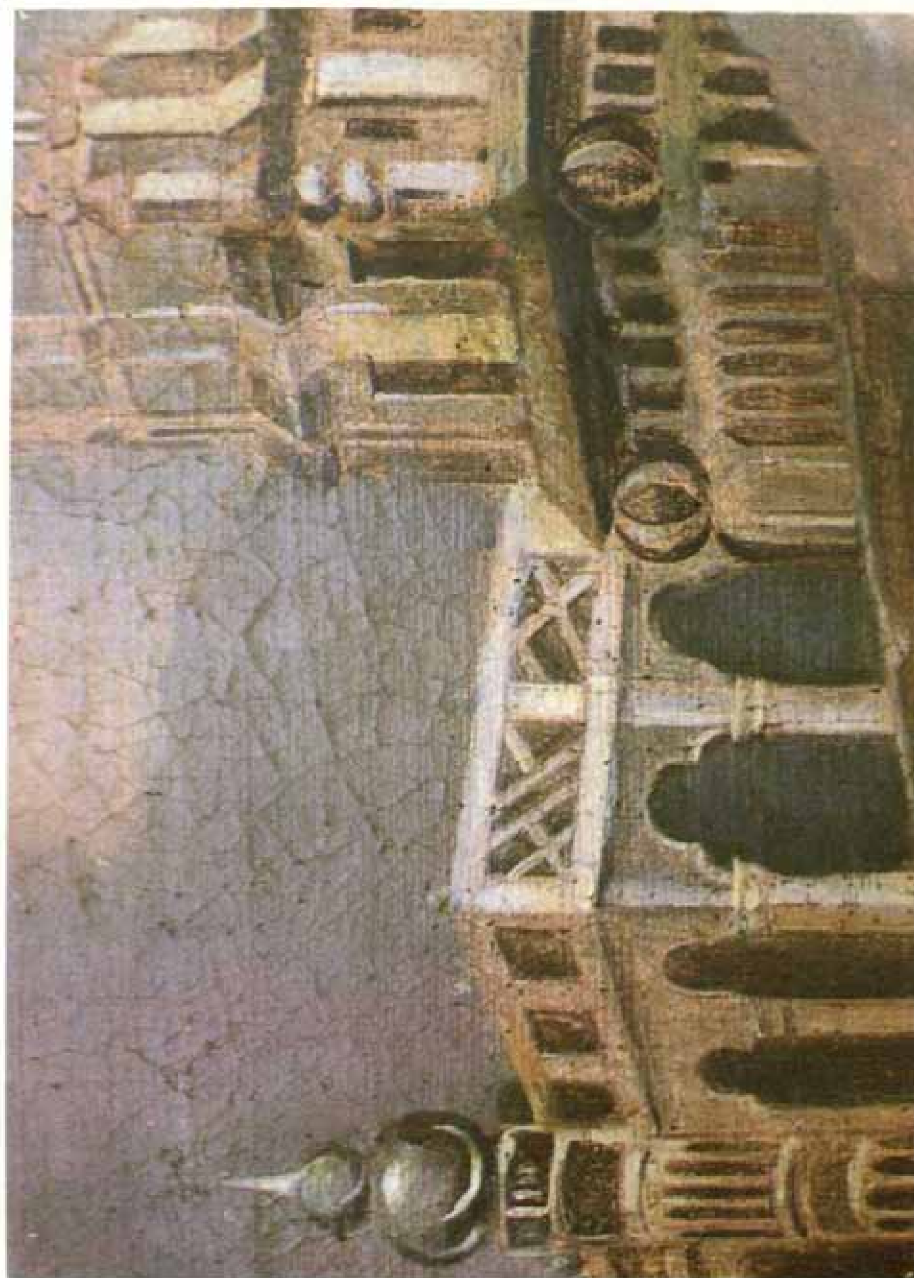


B

Champaner: Citadel Wall, A, *before and* B, *after chemical conservation.* *See p. 140*



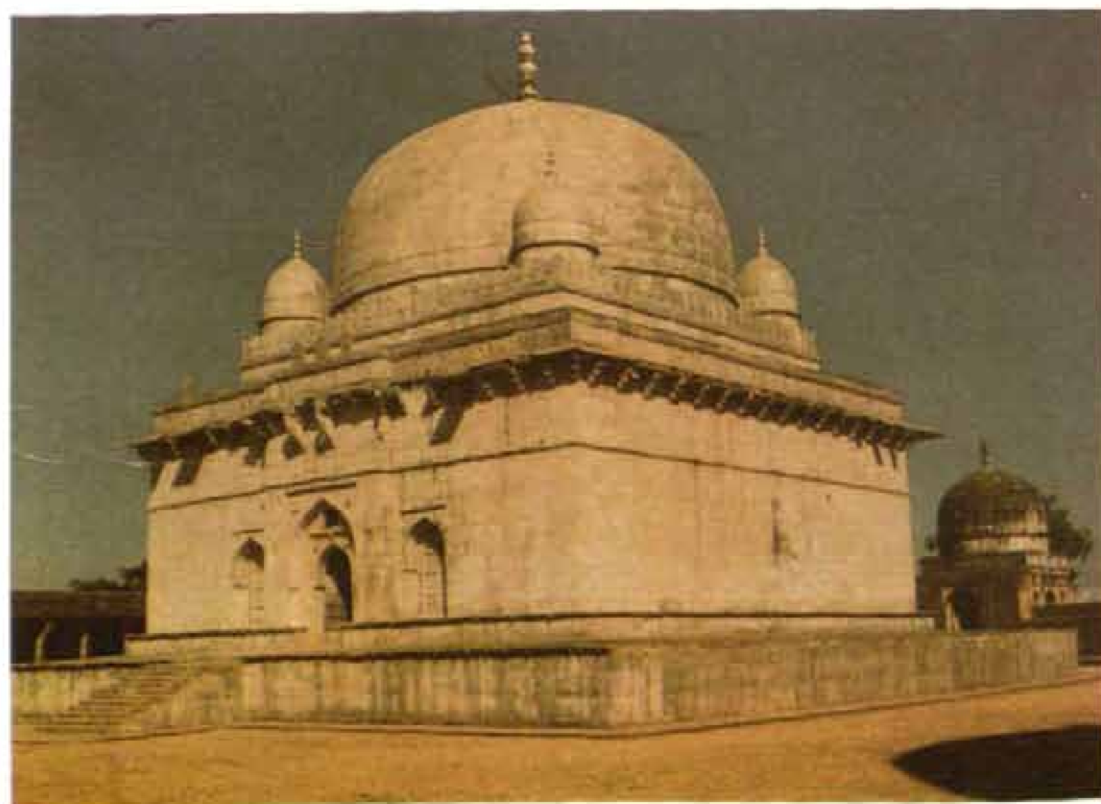
Srirangapatna: Daria Daulat Bagh, oil painting of the Archaeological museum, before chemical treatment. *See p. 143*



Srirangapatna: Daria Daulat Bagh, oil painting of the Archaeological museum, after chemical treatment. *See p. 143*



A



B

Mandu: Hoshang Shah's Tomb, A, before and B, after chemical conservation. *See p. 145*

